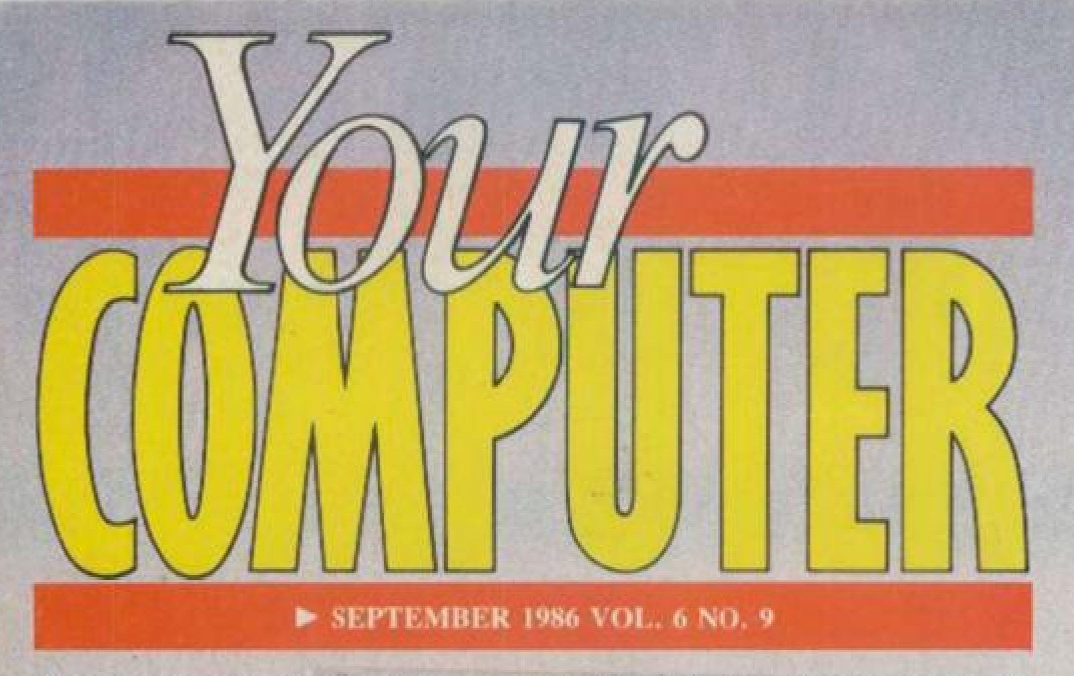


► SEPTEMBER 1986 VOL. 6 NO. 9

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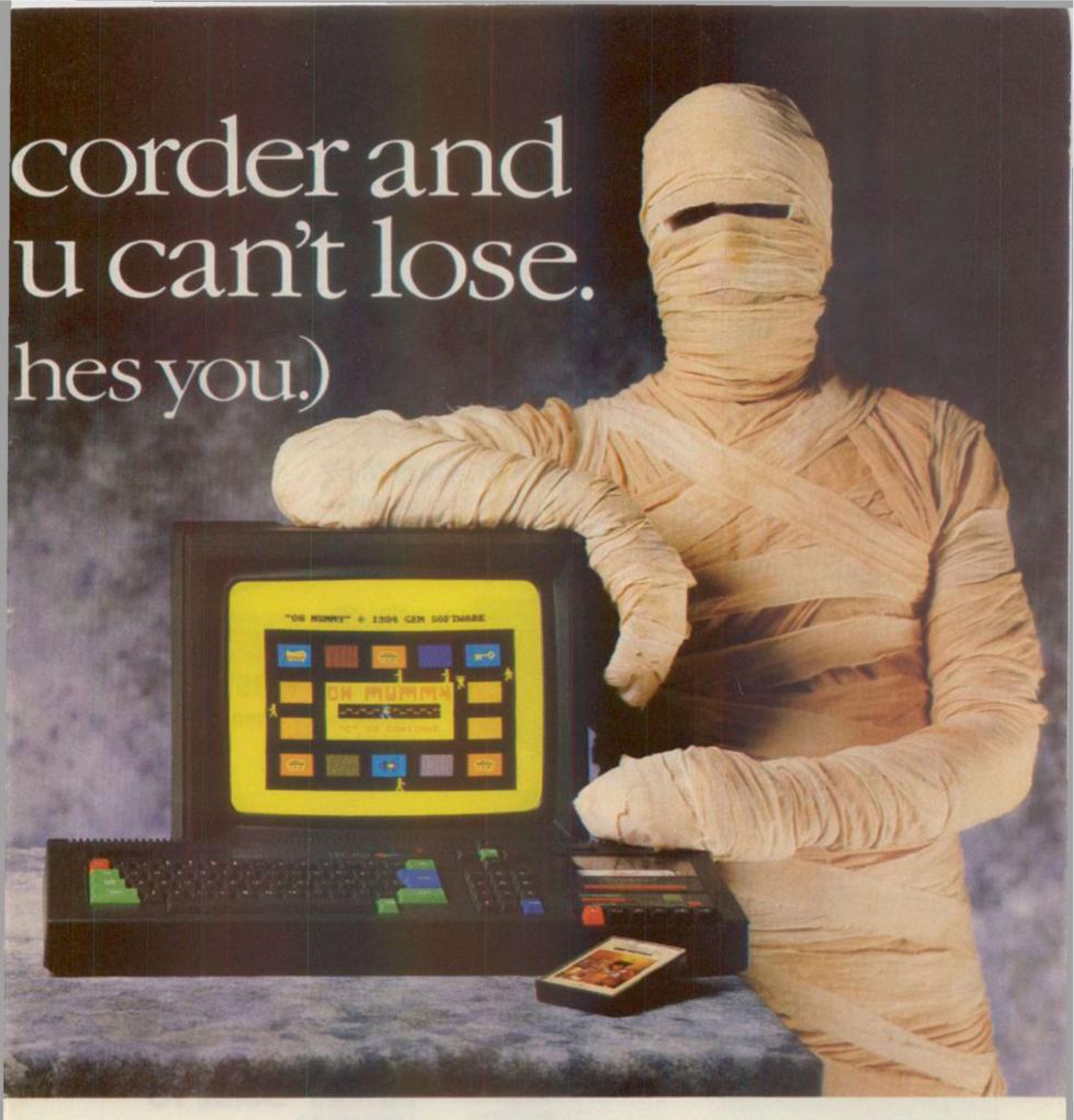
COMPUTER MAINTENANCE SURVEY

8-PAGE PCW SHOW GUIDE

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or the start of an eight-page guide to the g event of the year.

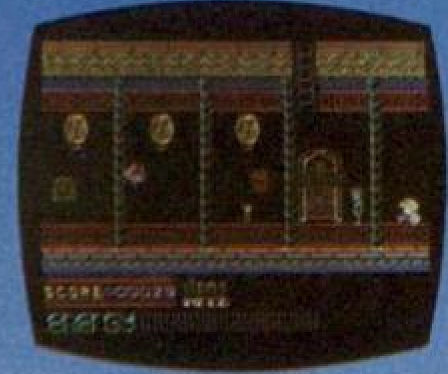






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Saturday Superstore (BBC-1)
"This is knockout! This is great! ... Wonderful! Very, very clever." ... Fred Harris

Micro Live (BBC-2)
"Really good value!" ... John Coll

REVIEWS IN THE COMPUTER PRESS

"The reproduction is suprisingly good, and certainly on a par with some of the more expensive speech interfaces I have heard. An excellent low cost speech synthesiser that really is very good value for money." ... ACORN USER

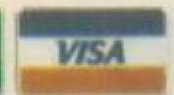
"... incredibly easy to use. The end result is as good as anything I've heard this side of the Amiga." ... POPULAR COMPUTING WEEKLY

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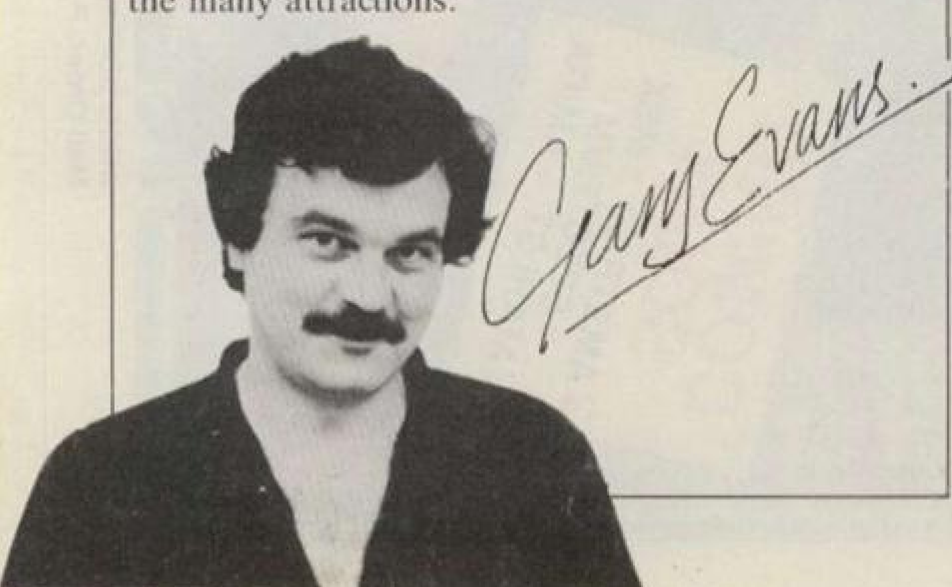
There can be little doubt that the Personal Computer World Show is one of the highlights of the computing year. One of the longest-established microcomputer exhibitions, it began life nine years ago in a small west London hotel. Since that time it has grown in size and is now one of the biggest such shows to take place in the U.K.

The success of the PCW Show can be attributed to a number of factors, from its timing to the exceptional mixture of business and home computer manufacturers which book stands. Early September is an ideal time for the event; the traditionally quiet sales period is by then left behind and companies are ready to announce products which will be available in time for the buying bonanza which characterises the later months of the year in the time leading to Christmas.

The PCW Show also manages to avoid the constraints of the many this-or-that user shows which take place throughout the year. That gives the Show a broad appeal for anyone with an interest in computing, whether they own a computer or are considering buying a machine. For those wishing to upgrade existing hardware, the Show also provides plenty of ideas.

With the division between business and home micros becoming increasingly blurred, the PCW computer is just one machine which has contributed to this. With the current crop of low-cost PC clones adding further to the confusion, the Show provides a rare opportunity for visitors to see a broad range of hardware under one roof.

In recognition of the importance of the Show, we have devoted eight pages of this issue of *Your Computer* to an extensive preview of the event. If you intend to visit the Show, make sure you have your copy of the magazine handy to guide you round the many attractions.



The IBM PC home computer

The IBM PC, or at least many of the low-cost imitators of it, is now officially a home computer. Amstrad this month joins the growing army of compatible manufacturers to offer PCs for less than £500, the traditional price barrier between home and business computers, with the full expectation that the £300 PC could be here by the end of the year – at least as a minimum single-drive starter system.

The Amstrad offering was expected to be unveiled officially just before the Personal Computer World Show in London this month.

The price for a basic Amstrad PC with 256K RAM, twin disc drives, bundled software and a monochrome monitor is expected to be £499. The system should have the Digital Research PC-compatible DOS-Plus operating system, the same GEM graphics-based environment as the Atari ST.

Unlike many other PCs running GEM, however, the speed of the Amstrad offering should be comparable to that of the Atari as it uses an 8086 processor running at a full 8MHz clock speed, the same as the IBM AT.

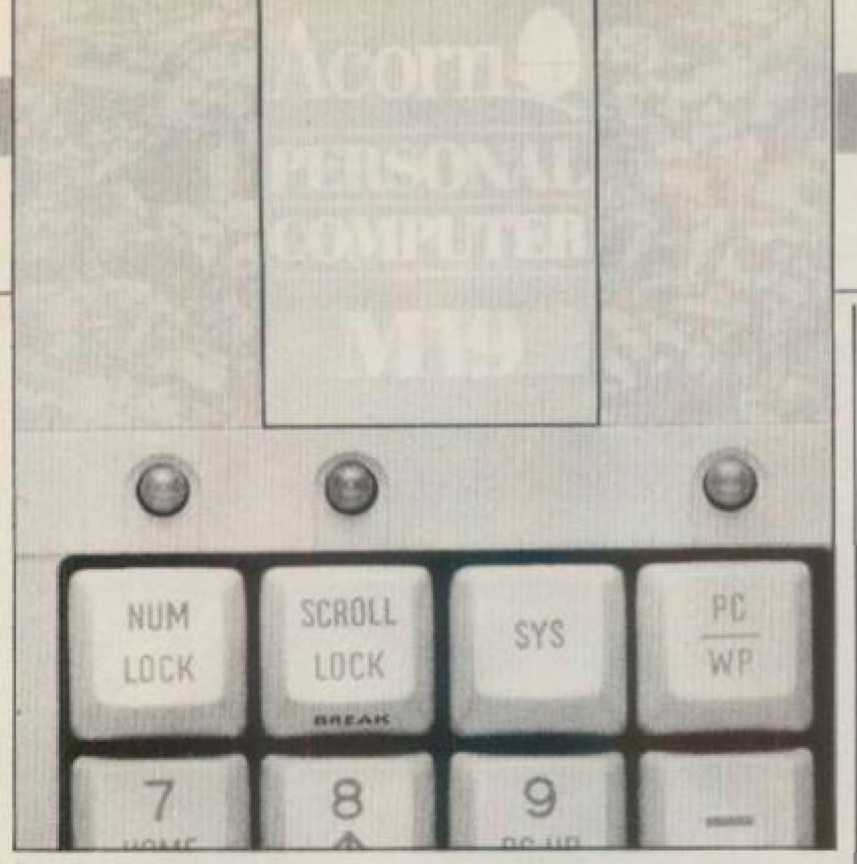
While the Amstrad move will definitely have a big impact on the public perception of the PC market, it certainly will not be the only company offering PCs at home computer prices. Bondwell, Citadel, Walters and many others are busy crowding into the £500-ish PC-compatible markets and existing PC compatibles such as the Tandy 1000 are falling in price ever nearer the £500 mark.

The real question is how well the PC will fare as a home computer. Although there has always been a good deal said about how Americans have much more disposable income than people on this side of the Atlantic, and that PCs have been bought as home computers in the States, there are still few games and entertainment titles available for it.

There are no on-board joystick ports, colour is still an expensive option, sprites cannot be defined easily and there is neither a version of *Elite* nor *The Pawn* available for the PC. We have to ask, with tongue firmly planted in cheek, how can it survive against the likes of the Spectrum and the CPC machines with such a handicap?

On a more serious note, one cannot help but wonder exactly who will be attracted by these home-computer-priced PCs. With the exception of the offering from Amstrad and some of the other well-known and respected manufacturers, many of the smaller companies offering inexpensive PC clones may not have the clout to attract the interest of businesses, nor the entree into the home market to sway people from the likes of the Atari ST, CPC and Amstrad/Sinclair entertainment machines.





Acorn sprouts new machines

The biggest number of new releases expected from any home computer manufacturer at the PCW Show was from an unlikely quarter. It is not Atari, Amstrad/Sinclair or even Commodore, but Acorn.

In addition to unveiling finally production versions of its Master 512 MS-DOS variation on the Master 12B computer – previewed in *Your Computer* in March – Acorn will also show its badged version of the Olivetti M-19 IBM PC-compatible and was expected to announce a new Baby BBC.

The Baby BBC could put Acorn back in the market it abondoned with its last cut-down BBC, the Electron. Both pricing and specification are expected to be somewhat high this time. The word at press time was that the new machine will include a built-in 3.5in. disc drive, offer compatibility with the BBC Master series and have a monochrome monitor for less than £600.

The cost reductions, which allow Acorn to bundle the drive and monitor, are expected to be in the interfacing. If true, that could be a major stumbling-block as the lack of BBC-compatible interfaces was always an impediment to the success of the Electron.

The Acorn Personal Computer M19, on the other hand, is a much safer bet. In its Olivetti version, which differs only from the Acorn offering in the colour of the badge at the front, the machine has been well-received.

The only real criticism the Olivetti M-19 has met so far has been the price and, at £1,499, Acorn is likely to suffer the same slings and arrows. Although the price includes a high-resolution monochrome monitor, twin 360K drives, PC standard keyboard, 256K RAM – expandable internally to 640K – serial and parallel ports, mouse interface and Econet networking it will still look expensive when compared to the new Amstrad PC.

The third new Acorn machine, the Master 512, has 512K RAM, MS-DOS, GEM and DOS-Plus and costs £345.26 plus VAT. That price does not include the disc drive needed to run the bundled software.

Compliment set to tackle Amstrad

Sales of the Amstrad PCW range of computers reached nearly a quarter of a million units since the launch in March, 1985. Many companies have begun selling their machines at greatly-reduced prices in an attempt to share in the success but, until now, none has attempted to produce a similar machine within the same price range.

On September 20, Saga Systems will launch the Compliment, a new Z-80-based micro which it hopes will beat Amstrad at its own game. Costing £299 plus VAT, £100 less than the PCW8256, the package will include a 3.5in. disc drive, a 100cps dot matrix printer and bundled software. A monitor is not included in the price but, even when that is taken into consideration, the overall cost could still be less than the Amstrad machine.

Saga is better-known for its range of add-on keyboards for the Spectrum and it is likely that the new machine will be based around one of them.

Competition winners

The answers to the competition in the June issue for a chance to fly in the famous Pit Special Aircraft were:

1. VIFF Vector in forward flight
2. a. GR3
b. FRS1
C. AV8A or AV8B
3. Operation Corporate
5. 1969.

Congratulations to the three first prizewinners, Andrew O'Donnell, 143 Henley Road, Caversham, Reading, Berkshire RG4 0DW; 2340878 Pte Milner, HQ company, 1 Green Howards, Mercer Barracks, BFPO 36; and D Hesford, 12 Harrison Street, Gee Cross, Hyde, Cheshire SK14 5RJ.

We liked particularly the beautiful design of Hesford. Twenty-five runners-up will receive the game and all entrants will receive a Strike Force Harrier poster.

Now there will be a charge for guide

The price of Amstrad PCW 8256 and 8512 computers has risen effectively by £5. The rise is a result of the decision to charge for the guide to the Mallard Basic software until recently supplied free.

According to an Amstrad spokesman, only one in 10 PCW users uses the Basic language and on that basis it decided to supply the manual as an optional extra. Thankfully, though, the Basic software is still supplied as a CP/M file on side two of the system discs.

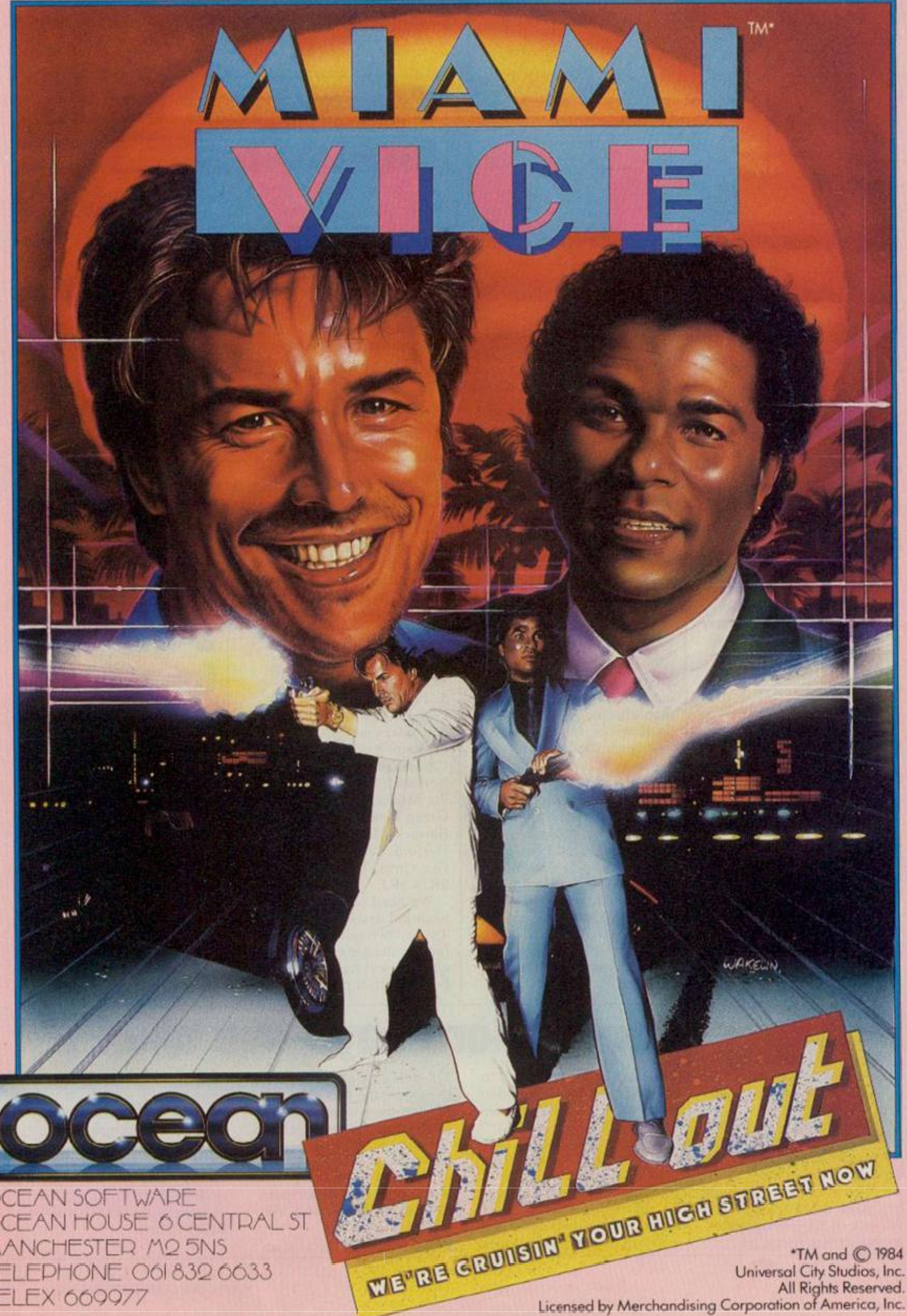
Commodore says 'we shall C'

Commodore was expected to unveil its updated Commodore 64C at the Personal Computer World Show this month. Despite the existence of the Commodore 128 and 128D machines, which are compatible with the existing 64, the new machine is expected to be a 64K machine.

It will be in a Commodore 128-style case and is expected to include the GEOS Macintosh-style graphics interface and improvements in operating speed and performance.

Probably the most important thing about the Commodore 64C, however, is that it will replace the existing Commodore 64, bringing an end to production of what is arguably the world's most popular 6502-based – actually 6510 – home computer.

The machine is expected to sell for less than £200 but Commodore was revealing nothing at press time as it had existing stocks of 64s it wanted to move first.



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This chart is based on the MicroScope chart as compiled by Gallup.

MicroScope GALLUP

MicroScope is the weekly trade paper of the microcomputer industry. If your computer store doesn't display the latest MicroScope chart, ask the manager to call Mark Salmon on 01-831 1433 — we'll send a copy every week.

THE CHARTS

TOP 20

1	GHOSTS AND GOBLINS	ELITE	SP CO AM
2	LEADER BOARD	U.S. GOLD	CO
3	GREEN BERET	IMAGINE	SP CO AM
4	KUNG FU MASTER	U.S. GOLD	SP CO AM
5	JACK THE NIPPER	GREMLIN GRAPHICS	SP AM MS
6	ACE	CASCADE	SP CO +4
7	KNIGHT GAMES	ENGLISH	CO AM
8	DRAGONS LAIR	SOFTWARE PROJECTS	CO
9	COMMANDO	ELITE	SP CO AM BB EL C16
10	SECOND CITY	NOVAGEN	CO AT +4
11	BOMB JACK	ELITE	SP CO AT C16
12	WAY OF THE TIGER	GREMLIN GRAPHICS	SP CO AM MS
13	TAU CETI	CRL	SP CO AM
14	THEATRE EUROPE	PSS	SP CO AM AT
15	ELITE	ACORNSOFT	SP CO AM BB EL
16	CAULDRON II	PALACE	SP CO AM
17	MERCENARY	NOVAGEN	CO AT +4
18	BOBBY BEARING	THE EDGE	SP
19	THEY SOLD A MILLION II	HIT SQUAD	SP CO AM
20	SILENT SERVICE	MICROPROSE	CO AT

BUDGET TOP TEN

1	NINJA MASTER	FIREBIRD	SP CO
2	SPEED KING	MASTERTRONIC	CO C16
3	MOLECULE MAN	MASTERTRONIC	SP AM MS
4	KIKSTART	MASTERTRONIC	CO AT C16
5	FORMULA ONE RACING	MASTERTRONIC	SP CO AM MS AT C16
6	THRUST	FIREBIRD	CO BB
7	KNIGHT TYME	MASTERTRONIC	SP AM MS
8	ONE MAN AND HIS DROID	MASTERTRONIC	SP CO AM AT C16
9	KANE	MASTERTRONIC	CO AM
10	STREET OLYMICS	MASTERTRONIC	C16

BUBBLING UNDER

REBLE STAR	FIREBIRD	SP
FREAK FACTORY	FIREBIRD	CO
TRAP ALLIGATA	ALLIGATA	SP CO V2
FULL THROTTLE	2.99 CLASSICS	SP CO
HI JACK	ELECTRIC DREAMS	SP AT
PYRACURSE	HEWSON CONSULTANTS	SP
COLLAPSE	FIREBIRD	AM AT
RAGING BEAST	FIREBIRD	CO
KING SIZE	ROBTEK	C16

MACHINE CODES:
SP = SPECTRUM; CO = COMMODORE; AM = AMSTRAD; MS = MSX; AT = ATARI; V2 = VIC20



The ultimate in communications for the Spectrum range from Modem House

Modem House claims that its VTX 711 interface is the ultimate development in communications for the 48 and 128K Spectrum computers. Fully-compatible with the Voyager series of modems, the interface has many exciting features including auto-dial, answer and log-on as standard, eight macros and a screen dump facility.

When combined with the recommended Voyager 7 modem, the interface will turn a Spectrum computer into a low-cost, full-function communications workstation with many features of more expensive packages incorporated as standard. Three separate software packages are supplied on cassette with facilities to transfer to disc or Microdrive. One package is designed as a full-function Prestel viewdata emulator; another is a bulletin board/electronic mail system; and the final package is a telesoftware downloader system with Prestel emulation. The VTX 711 pack costs £39.95 excluding VAT.

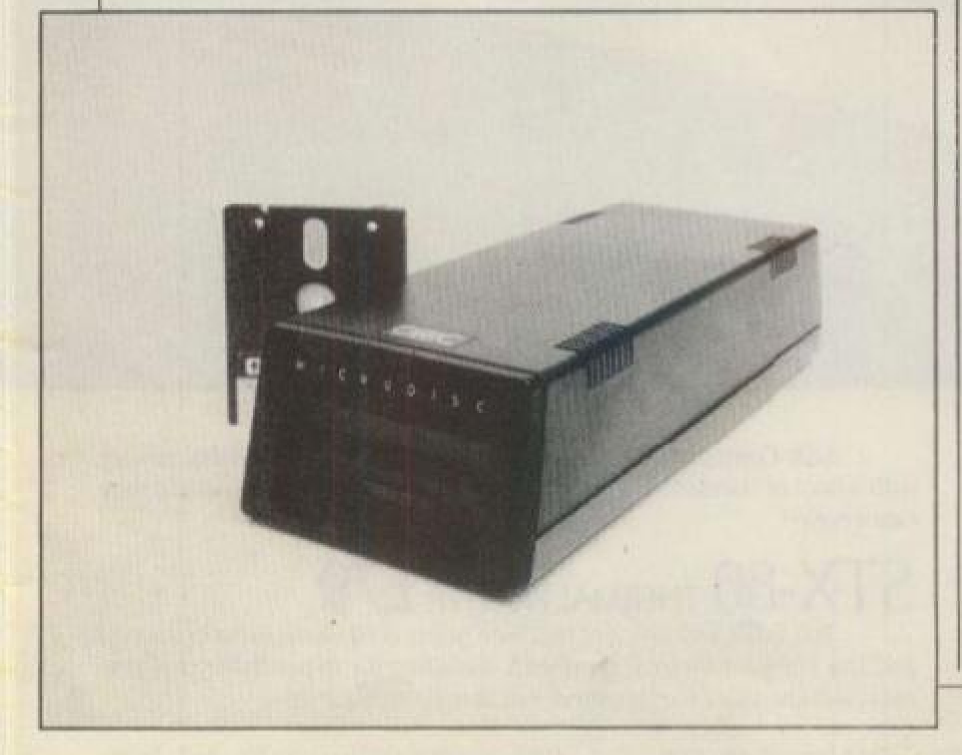
Modem House is also producing a complete package for Amstrad CPC owners. With auto-answer and auto-dial as standard and many other features claimed to do justice to the capability of CPC computers, the package is supplied as an interface with software on ROM written specially for the Voyager series modems. The entire package is available for £119.90 excluding VAT.

From tape to disc the Mirage way

Mirage Microcomputers Ltd has launched the Mirage Imager, a tape-to-disc transfer device for computers in the Amstrad CPC range. The Imager connects to the computer expansion port and, at the touch of a button, screen prompts appear allowing the user to save or load programs.

It also enables you to freeze any game at any point, save it, and then restore it later. A useful tool for multi-screen arcade or adventure game addicts, though at £49.95 its practical value for this purpose is a little suspect.

The manufacturer is confident that the Imager will not encourage copying or pirating of games. It has to be present during the saving and loading of any program, the files being unreadable unless the Imager is present.



Compufilter – protection from mains spikes

For those living in areas of high electrical interference, a recent addition to the Centronics Power Protection Package could form one solution. The Compufilter has been designed primarily to filter the powerline noise, RF interference and voltage spikes which often affect the performance of micro-computers and their allied systems.

The two models comprise a series of filters designed to eliminate both incoming and outgoing interference, by providing a high level of attenuation. The two- and four-socket models cost £19.95 and £29.95 respectively and are supplied with 1.5 metres of mains lead and a fitted plug.

Bargains galore for Oric owners

WE Software, a Worcestershire-based company recently linked with Eureka Informatique/Oric Products International and, for a limited period, is offering several Oric peripherals at reduced prices. The Eureka/Oric 3in. disc drive, complete with Sedoric, an advanced double-density disc operating system, is now available for £239.65, a reduction of £30.

Other items in the sale include the Oric V23 modem, complete with interface and software, a Cosmos printer and programmable joystick interface. Many popular Oric software titles are also available at reduced prices. The offer ends in mid-September.

Tandy reduces the price of its PC clones

It would seem that fear of competition from the long-awaited Amstrad PC clone is driving many companies to produce their own machines at lower cost. Tandy is reducing the price of certain models in its IBM PC-compatible 1000 range by up to £200. Prices now begin at £795 for a 256K, twin-disc drive machine with a mono monitor and rise to £2,195 for a 640K machine with a 20MB hard disc and colour monitor.

Both machines are capable of running a variety of MS-DOS programs, including *Lotus 1-2-3*, *dBase II* and *DR Graph*. Deskmate software is included. This is a package featuring word processing, spreadsheet and communications programs.

Saga keyboards – the last word in word-processing

Sinclair Spectrum owners, frustrated with those rubber keys on the earlier models of even the claimed professional keyboard on the Plus and 128K versions, may be interested in the latest product from Saga Systems Ltd.

The 2001 keyboard is suitable for all models in the Spectrum range, features an infra-red link between computer and keyboard and dedicated microprocessor control. The keyboard transmits to a receiving interface connected to the computer, which is also able to re-charge the board for a minimum of 72 hours' use. With such a good specification it is little wonder that the 2001 costs slightly less than £120 but it is supplied with *The Last Word*, an advanced word processing package which should ensure that the keyboard is put to good use.

A professional peripheral for the devoted games fan

Euromax has launched a new range of high-quality joysticks, most using short travel microswitches for maximum sensitivity. One of the top models in the range is the Professional A. Aimed at the sophisticated games player, the handgrip follows the same styling as the successful Pro Ace joystick.

With two ultra-sensitive fire buttons, one on either side of the base, even the most ambidextrous shoot-'em-up fanatic can blast away to their heart's content. If, however, your fingers should become tired, a small switch located near the rear of the stick puts it into auto-fire mode. Costing £16.95, the Euromax Professional A is an ideal weapon for dedicated games players.

The turbocharged Quickshot 2 – primed and ready for action

Spectravideo has recently announced the release of an improved version of the popular Quickshot 2 joystick. Aimed at frantic shoot-'em-up game fans, the Quickshot 2 Turbo uses directional microswitches claimed to give a faster response and greater sensitivity and has thumb and finger trigger buttons.





Eureka – the latest from Watford Electronics

Watford Electronics, one of the leading suppliers to the BBC micro market, has unveiled a new product called the Eureka card. On certain programs, the new RAM expansion card provides up to 14K more RAM than a 6502 second processor and costs considerably less.

Controlled by software in a standard sideways ROM, the card fits into the processor socket of the BBC and gives two banks of sideways RAM, one write-protectable, with user-programmable socket numbers. A new set of Osword calls are provided with the card to allow blocks of extra RAM to be written to and read from directly.

Automatic shoot-'em-up from Britannia

Britannia Software is producing a battery-powered joystick auto-fire adaptor which provides any standard nine-pin joystick with an auto-fire facility. The unit has a male and female nine-pin connector. The male end fits in the computer game port, while the joystick lead plugs into the female connector. Then, when the fire button is held down, the joystick autofires.

Costing £5.95, it is a useful tool for providing your favourite joystick with auto-fire but with so many manufacturers producing cheap models with auto-fire as standard, its appeal is likely to be fairly limited.

Textproc is another Britannia product but one which is likely to have greater appeal. It is a word processor for the Amstrad CPC range of computers available on cassette, disc or cartridge. The latter version must be used with the Britannia Romplus cartridge but is a very convenient format for the occasional user. Textproc allows for full editing of documents and text can be saved to tape or disc. Textproc costs £15.95, £17.95 and £21.95 for cassette, disc and cartridge versions respectively.

Einstein again

Tatung (U.K.) will be launching its new Einstein 256 at the PCW Show. This new microcomputer comprises two units: a CPU with a QWERTY style typing area and a 14in. colour monitor.

It will have 256K RAM, 512 colours and stereophonic sound. Based on a Z-80 processor, it will also be CP/M compatible and will run all existing Einstein software. The unit is priced at £400.

GAUNTLET

For U.S. Gold, 1986 has been relatively slow. Although it probably sold more software than many other software houses combined, it has failed to dominate the market. That is set to change between now and Christmas.

Obtaining licences for famous products has become so common that there are not many unlicensed products

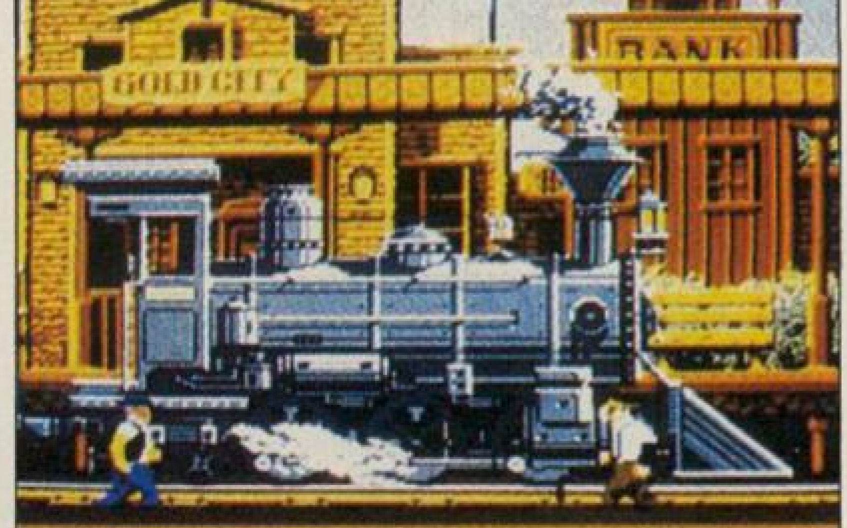

He-Man

remaining. Toys, books, films – almost everything can and has been licensed. In an unexpected move, U.S. Gold is to release two games based on *He-Man* and the *Masters of the Universe*, a popular children's toy and cartoon series. Apparently the license was obtained almost two years ago but only now was the market thought to be ready.

To be programmed by Adventuresoft, there will be both an adventure and an arcade game, pitting He-Man against the evil Skeletor. Both games will include many of the original characters such as Battle Cat, Orko and Man-at-Arms.

However successful Masters of the Universe will be, it cannot hope to compete with the arcade licence of the year. Elite may have had *Ghosts and Goblins* but U.S. Gold has *Gauntlet*.

One of the biggest-selling arcade games of all time, Gauntlet promises to be the biggest smash for home micros since *Ghostbusters*.



Express Raider

To be programmed by Gremlin Graphics, Gauntlet for the home micro will be only a two-player game, although you can choose between any of the four characters – Thyra, Thor, Merlin and Questor. To be released in November, across a range of computers, Gauntlet should be the game to watch at Christmas.

Undoubtedly the key to U.S. Gold success is the quantity as well as quality of its software and the latest releases promise to maintain that. Having signed a deal with Vortex, the software house behind such hits as *TLL* is to manufacture, promote and market its new titles, including the much-vaunted *Revolution*.

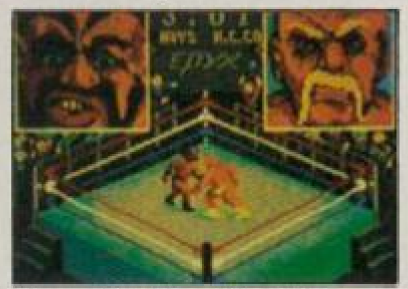
Epyx, too, plans for a bumper Christmas in the U.K. As well as *The Movie Monster Game*, Epyx is to release the fourth in its games series, *World Games*. Including such

Breakthru



events as high diving from Acapulco and barrel jumping from Germany, it looks to be just as good as its popular predecessors.

Fans of the arcade game *Hang-On* will be pleased to hear about *Super Cycle*, a *Pole Position* with motorcycles which manages to capture all the excitement of the arcades. Excellent graphics, realistic sounds and novel racing will make the



Championship Wrestling

game a sure-fire hit.

Championship Wrestling promises to clean up the fighting games market, with realistic movements and some novel visual effects. There are eight characters who you must fight, as well as the crowd, who hurl abuse from all directions.

Continuing the trend for arcade conversions, U.S. Gold has managed to license three top arcade games, all of which could well make it to the top of the charts. Shoot-'em-up fans will be pleased to see that *Xevious*, the popular Namcos arcade game, is soon to be available for computers, with all the blasting fun retained.

Data East, the company which gave U.S. Gold the rights to *Kung-Fu Master*, has provided two more potential hits, *Breakthru* and *Express Raider*. Breakthru is a five-section, horizontally-scrolling Commando-type game, except that you control a car rather than a soldier. Trying to stop you are tanks, helicopters, jeeps and a variety of other hazards. If it is converted well, it could repeat the success *Commando* and *Rambo* achieved.

Express Raider is a train game with a difference. Set in the good old west, you must hi-jack a steam train before it reaches the station. The smooth scrolling and large characters will be difficult to convert but, if achieved, the result could be spectacular.

Last, but definitely not least, is Chris Gray's *Infiltrator*. Taking the U.S. by storm, it provides something for everyone with arcade, strategy and flight simulation all built-in. Using all his skill for designing games – and he was responsible for *Boulderdash*, one of the most playable games of all time – Gray has created a masterpiece, which will be reviewed fully next month.

Express Raider





Crockett and Tubbs



Ocean software, producer of such smashes as *Hunchback*, has released two new games for the Commodore 64, both of which are set to take the games market by storm, one way or another.

The first, *Parallax*, is a true shoot-'em-up, only with subtle differences. No longer is the only objective to cremate everything which moves. In Parallax a great deal of thought is necessary before it is possible even to approach completion.

Graphically, Parallax bears an obvious resemblance to Andrew Braybrook's monster hit *Uridium* but when you start playing it becomes apparent there is a great deal more gameplay. Using mettalix graphics and clever shadow effects, you can fly both above and below the ground.

However pretty Parallax is, it is Martin Galway's soundtrack which makes the game and he is without doubt the most talented musician on the Commodore 64. Another soundtrack he has produced recently is for another of the new Ocean games, *Miami Vice*.

Based on the popular television series, the games lets anyone adopt the role of Crockett and Tubs and try to stop the ever-increasing drugs problem. As with the series, most of the time is spent cruising round the streets of Miami, with the odd interlude to kill a few smugglers.

Again, the graphics are good and the soundtrack is superb, with an immaculate representation of the theme tune. Both games will be reviewed in next month's issue and should be available from the beginning of September.

Fairlight Hits the PCW

In a move obviously intended to fight head-on with *Batman* from Ocean, The Edge has released its own three-dimensional arcade adventure, *Fairlight*. Released originally for the Spectrum, it has excellent graphics and some devilish puzzles.

Although similar visually to Batman, Fairlight is much more of an adventurers' arcade game, with much more thought required rather than pure manual dexterity. Costing £14.95, Fairlight is available now.

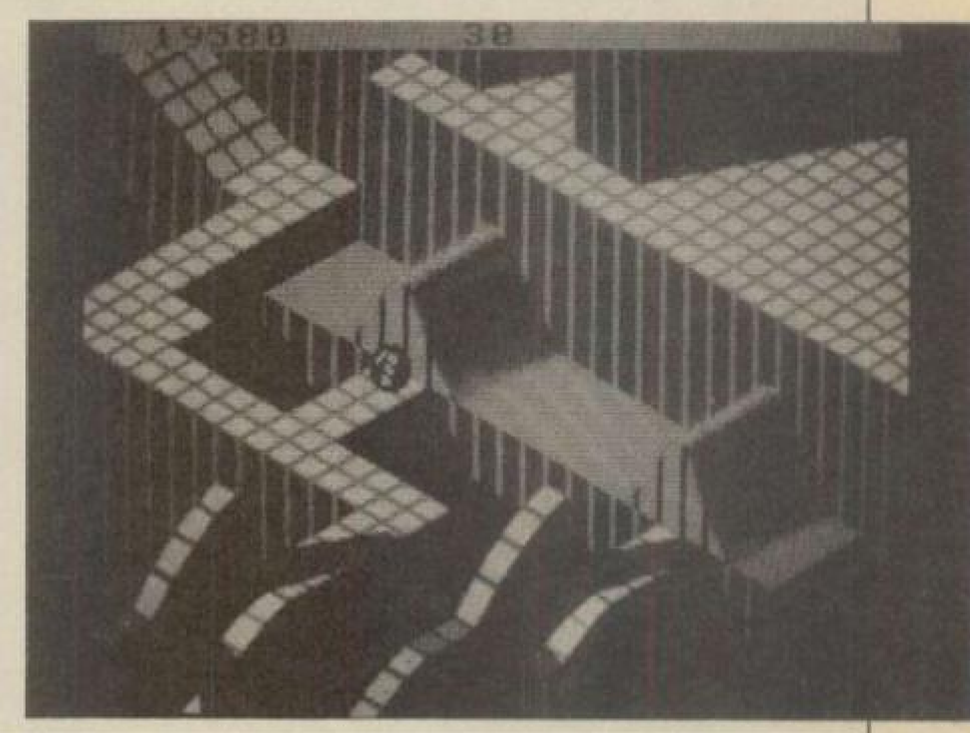
Electric Dreams of XARQ

Activision owner Electric Dreams has just released its latest game. Called *Xarq* and programmed by Nick Cook, it promises to provide many hours of enjoyment for all gamers seeking a challenge. Costing £9.99 and available for the Spectrum 48/128K, it will be reviewed in full next month.

Complete madness

Fans of the brilliant arcade machine *Marble Madness* will be happy to hear that it will soon be available for the Commodore 64. If you own an Amiga, however, you will be able to buy the game immediately, courtesy of Ariolasoft. Costing £29.99 for the Amiga, it is as close as anyone will ever get, right down to the music and animation. Control is via the mouse, although on the 64 it will be using the joystick.

For release in early September, it is set to be an essential part of any arcade player's collection, and priced at around £10 it is considerably cheaper than the £2,000 arcade machine.



By the grace of God

Trivial Pursuit fanatics who can wait no longer for the Domark official version will be pleased to hear that Arcana Software has released *Powerplay*. Released originally for the BBC but now available for the Commodore 64 and Amstrad, it allows four players to take the roles of Gods and to battle for victory.

With more than 2,000 questions and the ability to create your own, together with sound and three-dimensional graphics in various arcade sections, it should appeal to all the family.

The additional temptation of a holiday in Greece for two lucky owners might help, too.

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Amiga – a powerful editing terminal

The Commodore wonder micro, the Amiga, is the ambitious choice of main viewdata editing terminal to be used in conjunction with the new Micronet in-house viewdata database computer, a Unix running DEC MicroVax 2.

At first it is not easy to see the logic of choosing such a glamorous micro for the somewhat specialised task of editing a viewdata database but, with the help of a new comms package from Watford-based Y2 Computing, the Amiga suddenly became the only choice over more established alternatives. Viewdata editing terminals are not exactly high-volume sellers because of their specialised nature and it was found that the very expensive few on offer could not cope with the required 9,600 baud link with the Vax.

everything required of a specialised editing keyboard can be accomplished via mouse through the Y2 software. The multi-tasking prospects of having word-processed text in one window and a Prestel editing screen on another simultaneously-visible screen is a prospective reality, making the Amiga an even more logical choice.

London-based Brainstorm Computers will be supplying the software heart to the new Micronet £100,000 Vax system, with a specially-written and customised viewdata front-end to the Unix operating system. Along with the 12 Amiga terminals for journalists to use, there will be direct update links with Prestel computers and eventually a Gateway link for forthcoming specialised Micronet services.

Free Prism modems from Prestel

From the beginning July, Micronet has been giving new subscribers to its Prestel database the option of claiming a free modem as part of the subscription. Micronet has around 10,000 Prism 2000 and VTX5000 modems to give away as part of its marketing drive.

While rumours continue to circulate of a large-scale subsidised modem program from BT and/or Prestel, it is encouraging to see at least one company lending its albeit relatively small weight to encourage microcomputer comms in the U.K.

Let us hope Micronet can set some kind of precedent for future efforts.

New features for Prestel

In the last year, Prestel has had its fair share of criticism for being inefficient and out-of-date because of its restrictive number-pad-orientated origins. Prestel has responded by announcing enhancements to the Prestel Mailbox service and the prospective introduction of keyword searching.

Prestel Mailboxes will be up to four times longer than they are at present, with a faster method of perusing incoming mail. Mailboxes will also be able to be read and dealt with in any order, rather than in turn as at present. It will be possible to forward incoming mail easily to other mailboxes and replies to incoming mail will be made easier by not having to re-type the recipient's MBX number.

It will be possible to store unfinished messages for later use and you will also be able to send the same message to several other recipients automatically by entering MBX numbers into a mailing list on-line.

Unfortunately the Mailbox improvements probably will not be implemented until next year but the keyword search system is scheduled for this autumn. The search facility will be limited to searching special indices. Therefore you might be able ti key *SPORT to obtain an index of sports features but you would not be able to type e.g., *Daley Thompson for occurrences of strings or names within articles.

Teletel opens its doors for French-speaking BBC computer owners

If you have a BBC micro, a limitless telephone bill budget and a working knowledge of French, you can access the French Teletel system from the U.K. Aldoda International has announced a ROM or disc-based Teletel-emulating terminal package for the BBC micro.

Teletel uses a non-standard, extended characters/colours display specification and the Aldoda package uses the BBC mode 1 graphics screen mode to emulate most Teletel functions.

More information can be obtained from Aldoda International, 201 Haverstock Hill, London NW3 Tel: 01-794 0991.

Observe the news on viewdata

It now looks as if Prestel will soon feature a daily international and national news service sourced from *The Observer*. It is understood that negotiations with *The Observer* to make use of reports already circulated daily via Telex and facsimile are at an advanced stage. At the time of writing, Prestel was unavailable for comment.

A new home for the Gnome

Despite nearly winding-up due to lack of finance earlier this year, the very popular and charismatic independent viewdata Bulletin Board, The Gnome at Home, is set to expand. Run by Glyn Phillips, who used to be one of the partners running SoftMachinery, the BBC-based comms software house, The Gnome at Home is an advanced multi-user-capable viewdata BB running on an Acorn Econet network.

TG&H is a very professional set-up, modelled on Prestel, and is several leagues ahead of traditional 300-baud single-user BBs which abound. Several telephone lines are installed to the north London-based TG&H, which can be accessed by dialling 01-888 8894. Recent financial realities have now forced a reluctant Phillips to charge an annual £18 subscription per user for access to the full range of features, though there are no time charges.

Versions of the much-honed TG&H host software are being offered for sale at £500 and £2,000.

The T-3100 – a Japan

Geoff Wheelwright looks at a portable PC-compatible from Toshiba. This extremely fast and powerful machine is expected to impress the business market.

While many dream machines are the products of individual fantasies about the ultimate games computer or the greatest business PC, there is one which seems to transcend everyone's individual preferences – the portable computer.

Alan Kay, creator of the Windows, Icons, Mouse and Pointer – WIMP – system, copied later by Apple and Atari – called his ultimate portable computer idea the Dynabook, while Sir Clive Sinclair thought the concept was so important he called it Pandora, after the Greek box of tricks which let loose man's infallibility.

There is something innately attractive about trying to fit all the power of a traditional business computer into something with a handle which can be carried. Until recently, however, the handle was dwarfed by the huge box beneath it.

All that has changed in the last 12 months with the release of machines such as the Toshiba T-3100 computer, the subject of this month's dream.

Imagine a machine which uses the same computer processor as the powerful IBM AT, which this column encountered in the July issue, offers up to 2.6MB of internal RAM expansion, includes a gas plasma flat-screen CRT-style display, runs at 7.16Mhz – up to five times faster than the standard PC – and includes both a 10MB hard disc and a 720K 3.5in. floppy disc.

Imagine, as well, being able to afford a machine priced at more than £3,200. When you have done all the imagining, I will tell you what a real dream the machine was to use. Not only did it run all the important IBM PC software I could throw at it but it did so at high speed and with a display which could put many standard monochrome monitors to shame.

Hard disc

All that performance, however, is obtained at a price. Not only is the machine expensive but it does not run on batteries. The main reason for that is the hard disc; that kind of storage power would breathe the life out of two double-A cells within minutes of putting them into the machine. That is probably just as well, because the 3100 could not use its brilliant flat-screen display without the mains-provided power.

The need for mains power in no way detracts from the portability of the machine. At only 15lb. and with the otherwise-identical T-2100 PC-compatible twin-floppy version at less than 10lb. the T-3100 probably provides more power than you are likely to get anywhere else in such a small box. The sliding handle is built into the back of the machine and can either be extended for carrying or placed at 90 degrees to the machine to give a typing tilt.

You will also find a large number of rather essential interfaces at the back of the machine as well. Parallel and serial ports are provided as standard, along with an RGB colour monitor output, clock/calendar and expansion port – for a box which allows you to use up to five IBM PC and AT expansion cards. The parallel port also doubles as an external 5.25in. disc drive connector, so you can install popular business applications on the hard disc.

Disc format

The main thing I noticed about the T-3100 is just how many of the designer's dreams must have gone into making it. It is obvious from the reduced size of the keyboard that the width of it was of considerable importance. To keep that to a minimum, the traditional 10 IBM function keys have been moved along the top of the keyboard, with the numeric keypad functions doubled-up on keys in the right-hand section of the keyboard.

The only real difficulty which that reconfiguration may pose is in some business software applications, where the designers rely on keys being in a certain place. Given that the keys on the T-3100 are sufficiently close together it is not too difficult to effect many varying key combinations, so that should not be insurmountible.

The other great wish-fulfilment the T-3100 provides is in the way it handles disc formats. Not only will the T-3100 read its own 720K 3.5in. floppy discs but also regular 360K 5.25in. discs, using the external drive, and also 360K 3.5in. floppy discs written to MS-DOS format. That meant that I could use discs interchangably



Fold-away display.

ese take-away

between the T-3100, the Apricot XEN – featured as last month's Dream Machine – and the Atari 1040ST.

All those features, however, would be worthless were it not for the brilliant T-3100 screen display. The display, usually of the LCD type, has been the downfall of so many portables – the Apricot Portable and the Apple IIc to name two – that it was a genuine relief to switch on the T-3100 and see the bright, well-lit gas plasma display.

Pedigree portable

Gas plasma is not inexpensive. It is probably the single biggest cost factor in the machine, aside perhaps from the hard disc unit, and certainly represents the state of the art in flat screen display technology. It presents a brilliant resolution and is good enough to allow the T-3100 screen to emulate a colour monitor, so that most IBM PC software, whether it is configured for a colour or monochrome display, can be displayed effectively on the T-3100.

The one great fear which can turn many a portable computer dream into a nightmare is what happens if the machine is dropped. Aside from being very unpopular with Toshiba, you might think that dropping the machine would send gallons of glass plasma oozing all over the pavement. More important, you would certainly have a valid concern about the state of the hard disc, a device which needs to be finely-calibrated.



It seems that Toshiba has taken a few leaves from the Compaq book in developing the T-3100 and Toshiba says it has tested the hard disc to withstand up to a 70G force, which is a considerable degree of knocking about. That bodes well for the machine's portable pedigree. Far too many people forget that it is just as important for a machine to be able to withstand the rigours of being moved as it is to be small enough to do so.

Sweet dreams

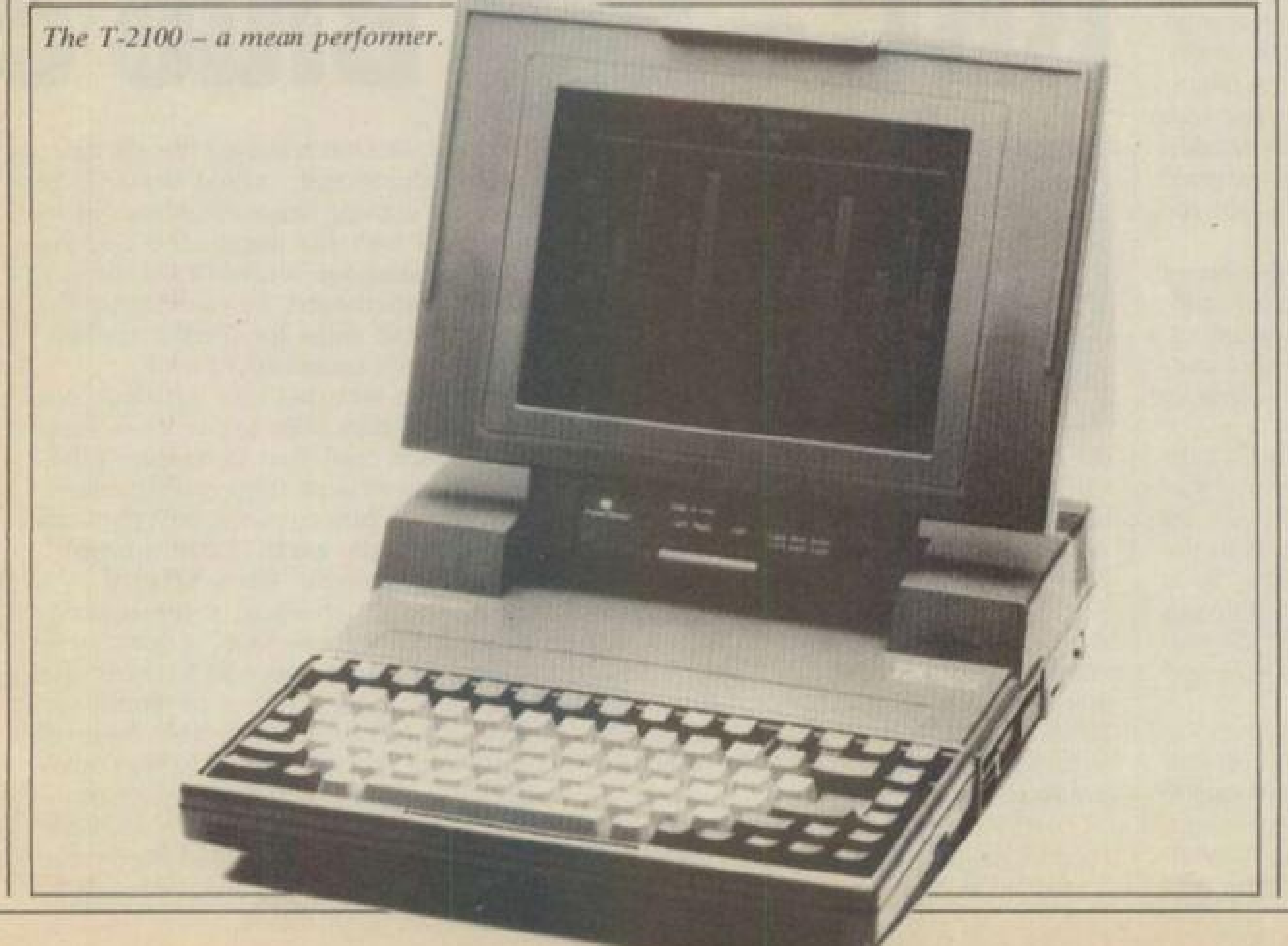
One of my complaints about portable computers, and computers in general, is that they have never been tough enough to trust to the cargo hold of an aircraft. That always means that one has to take them as carry-on luggage, causing major disagreements about the amount of room there is likely to be beneath the seat and the weight restrictions of the overhead bins. The T-3100 solves the difficulty by being small enough to carry on to an aircraft but is tough enough to put in one's luggage.

Toshiba is billing this machine as something which can replace a standard desk-top PC, not simply an attractive adjunct to it. It is certainly priced like a desk-top machine and performs like one.

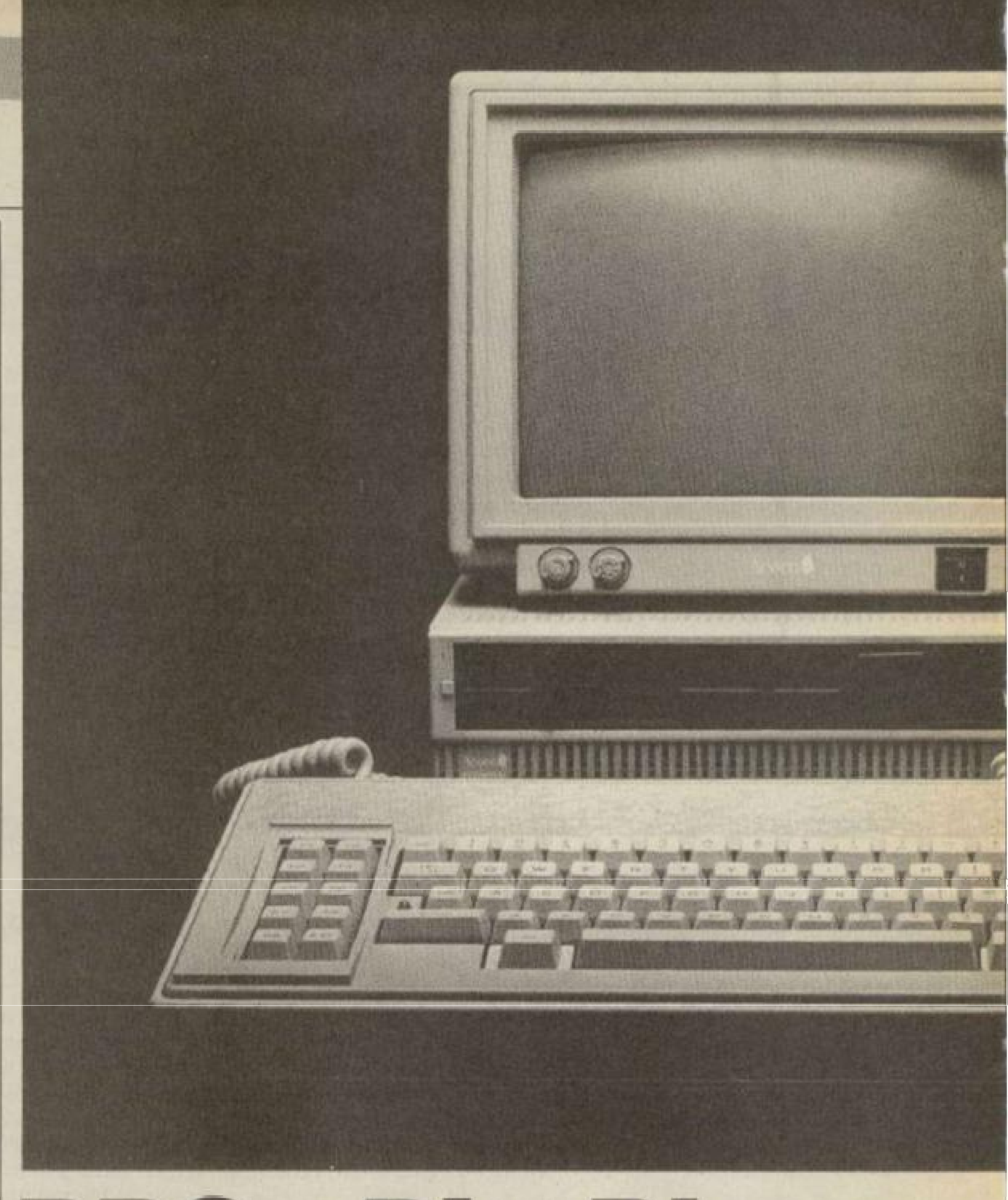
The only real disadvantage to this argument has less to do with portability than its flexibility. Like most of the so-called lap-top PC-compatible and AT-compatible portables, there is no room inside the Toshiba for IBM-compatible expansion cards.

Although the machine already includes or offers options for most of the popular expansion upgrades – hard disc, parallel/serial, external drive, RGB, internal modem and memory expansion – there are some things, such as dedicated network connections, which cannot be included in the body of the machine and will require the previously-mentioned expansion card cage.

All in all, however, playing with the Toshiba T-3100 still must be one of the most pleasant portable computer dreams I have had.



The T-2100 – a mean performer.



BBC – Big Blue co

Acorn hopes that the M19 will give it a bigger share of the higher educational market. Anthony Thompson assesses its chances.

Acorn has long been the market leader in the field of educational computing, especially in primary and secondary sectors where the BBC Model B machine became almost standard equipment in many boroughs.

The Master 128K was a more powerful machine with more memory and the 512K upgrade kit gave the added advantage of being able to run some MS-DOS software, though it was not sufficient to make the machine truly PC-compatible. Higher education establishments wanted a machine on which they could teach the professional program packages which their students would be likely to encounter in a modern office environment.

In response to the demand for an industry-standard micro, a PC clone produced a package complete with 10 demonstration programs, including GEM, WordStar 2000 and SuperCalc 3.

Acorn makes no secret of the fact that the machine is a re-badged version of the Olivetti M19; the injection mouldings, instruction booklet and packaging all bear the Olivetti name. The installation and user guide, however, has been compiled by Acorn specifically for its version of the machine.

Striking feature

The first striking feature of the M19 is its size, or distinct lack of it. With a footprint of 12.7in. by 15in., it is less than half the size of a standard PC. The machine is supplied in three parts – monitor, keyboard and base unit. Power for the system is supplied from the high-resolution mono monitor, one of the major reasons the base unit is so small. A colour version will be available later in the year but to use one now would involve the additional expense of adding an external expansion box to power the rest of the system.

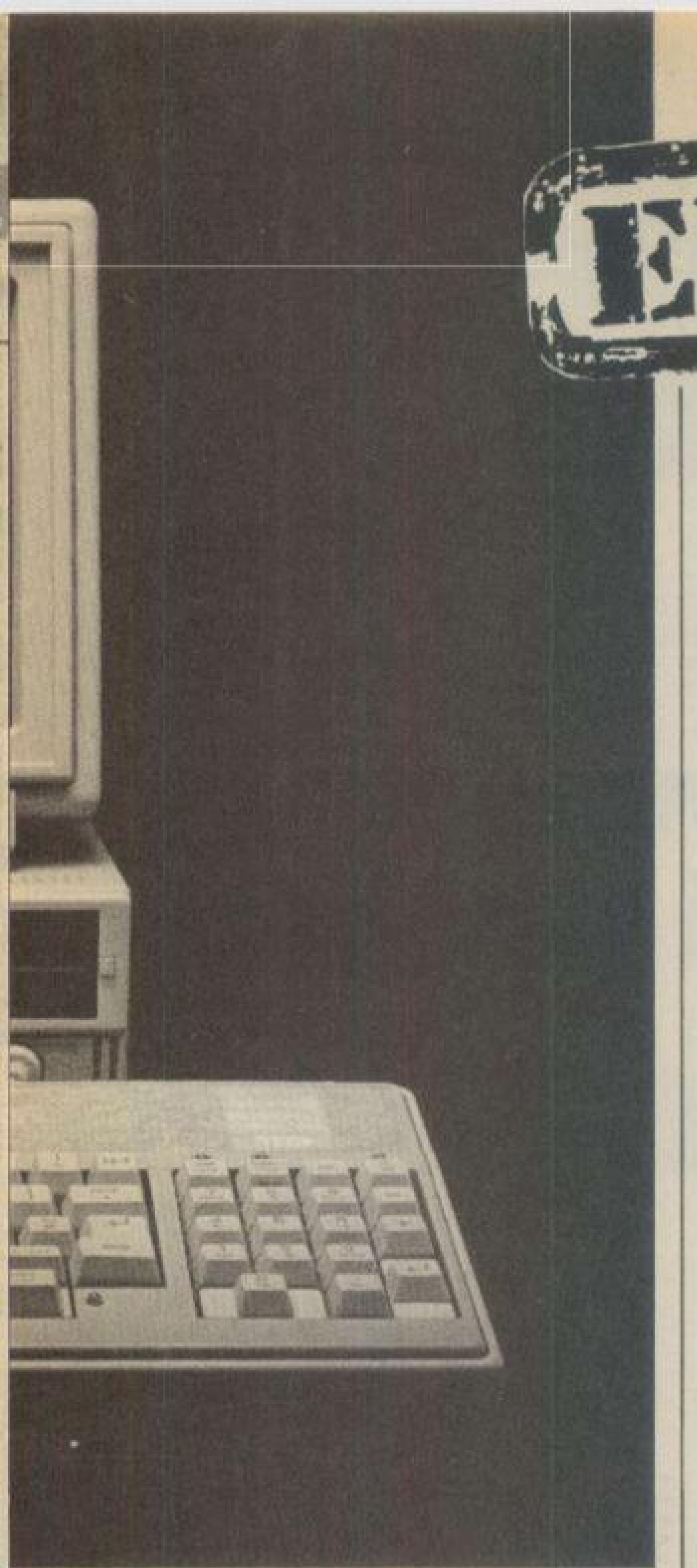
The monitor can provide a resolution of up to 640 x 400 with three other modems available for the text and graphics. It features brightness and contrast controls, as well as a system on/off switch on the front panel.

The base unit has two built-in half-height 360K disc drives set into the front panel. The central processing unit is based round the Intel 8088 processor, as in the IBM PC, running at 4.77MHz. It is interesting that neither Acorn nor Olivetti decided to incorporate the faster 8086 processor, used in the best-selling M24 and running at 8MHz, in the M19.

To have given the machine such increased processing power, combined with its compact size, would surely have made the M19 more appealing to many mopre prospective buyers. An upgrade is available which replaces the standard chip with the 8088/2 which also runs at 8MHz. The full kit includes a switch at the back, allowing the clock speed to be changed at will. At the rear of the base unit are blanking plates concealing the two expansion slots. Three interfaces are also provided as standard – an RS232, Centronics parallel and a video output. They are linked directly to the motherboard, unlike the IBM PC which uses three of its eight expansion slots to provide those valuable connections.

That is one reason the machine has such seemingly limited facilities for expansion. The other is that Acorn believes that the market at which it is aiming the machine, mainly educational, would have little reason for wishing to use use many expansion cards with the machine. Even the memory expansion is carried-out directly on the motherboard, by exchanging the 64Kbit RAM chips for 256KB replacements up to a maximum of 640K.

For those who buy the machine and then decide they want to use some form of expansion card there is another problem. Due to its neat, space-saving dimensions, the machine cannot accept standard IBM expansion cards. Four miniature cards are available from Olivetti – a second RS232 interface, a synchronous communications interface, a local area network interface and a SCS1 hard disc controller card. The last-mentioned becomes necessary when the optional 10MB hard disc unit is fitted. That operation also unearths its own set of problems; in addition to losing a valuable expansion slot and the second floppy disc drive, a fan to keep the unit cool must be



EXCLUSIVE

mpatible

installed. If you must use IBM-style cards with your M19, you have no alternative than to buy an expansion box which fits into an existing slot and allows for a single IBM-type card to be used. That would allow a miniature hard disc card to be installed which would then obviate the need to lose a precious disc drive or to install a cooling fan.

Useful

The base unit has two other features which set it apart from many machines in the same range. The first is a re-set switch which protects valuable components in the machine by eliminating the need to use the main power switch to re-set the machine. The second feature, attached to the re-set switch, is a volume control knob, a useful device but one which is often overlooked on many PC clones.

The keyboard is a standard PC design, a QWERTY typing section bordered by function keys and a numeric keypad. There are 10 function keys which, when used in conjunction with the shift and control keys, give a maximum of 30 programmable functions.

The keyboard has a built-in tilt to give a better typing position, using two adjustable feet at the rear. The colour scheme is a little strange but the overall effect is pleasing. Finished in the usual office grey, the keys are printed in blue ink and the five LED indicators are amber. Should you wish to use a mouse, a port at the rear of the keyboard allows an additional interface to be connected.

When the complete unit is placed on a desk, the keyboard seems to occupy a good deal of the available space, being almost twice as wide at the base unit. It is a pity that the keyboard was not redesigned with the function keys in a row along the top; that would have reduced the overall length and kept the machine's components in proportion.

Test disc

Three discs are supplied with the manual. The *Getting to know the M19* program gives the user a graphic description of the main components with a fair amount of technical detail. It also details of some of the optional devices, such as expansion boxes and hard discs which may be bought. The customer test disc puts the machine through some extremely thorough diagnostic procedures, while the final disc contains the MS-DOS utilities and the keyboard drivers for other European versions.

Overall, the Acorn M19 is a very well-designed PC though, at £1,499, it seems too expensive to be likely to sell in vast numbers. For Acorn, the old adage of getting what you pay for holds true. It is well aware of the increasing number of cheaper clones becoming available but believes its machine is built to a higher standard.

Limited expansion

It is limited not only by price but by its lack of compatibility with IBM-style expansion cards. Only four are available from Olivetti which, like Acorn, has no plans to produce more. When the Olivetti version was launched, many felt that the machine, although a good entry-level compatible, left a good deal to be desired in the expansion and clock speed areas.

It is a pity Acorn could not have made some of those improvements before marketing the machine. It must be remembered, however, that the educational market, where Acorn is undoubtedly the dominant force, is more likely to spend extra cash for an Acorn product rather than risk one of the lesser-known clone manufacturers.

NAME	PRICE	STANDARD CONFIGURATION	PROCESSOR
Acorn M19	£1,499	256K memory on motherboard, 2 x 360K disc drives. 12in. mono monitor, 2 expansion slots.	8088 running at 4.77 MHz
IBM PC	£1,699	256K memory, 2 x 360K disc drives. 12in. mono monitor, 5 expansion slots.	8088 running at 4.77 MHz
Walters PC	£599	256K memory, 1 x 360K disc drive. 12in. mono monitor, 8 expansion slots.	8088 running at 4.77 MHz
Opus PC II	£499	256K memory, 1 x 360K disc drive. 12in. mono monitor, 8 expansion slots.	8088/2 running at either 4.77 or 8 MHz
ARC World PC	£475	256K memory, 1 x 360K disc drive. No monitor, colour or monochrome graphics card. 5 expansion slots.	8088/2 running at either 4.77 or 8 MHz

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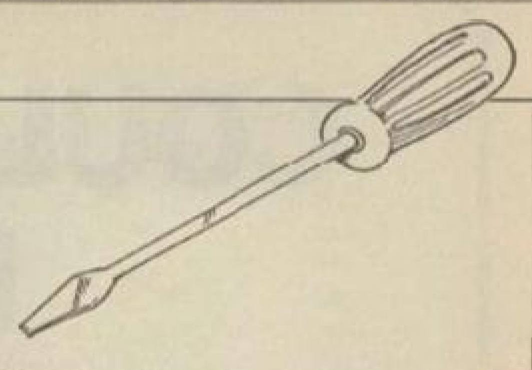
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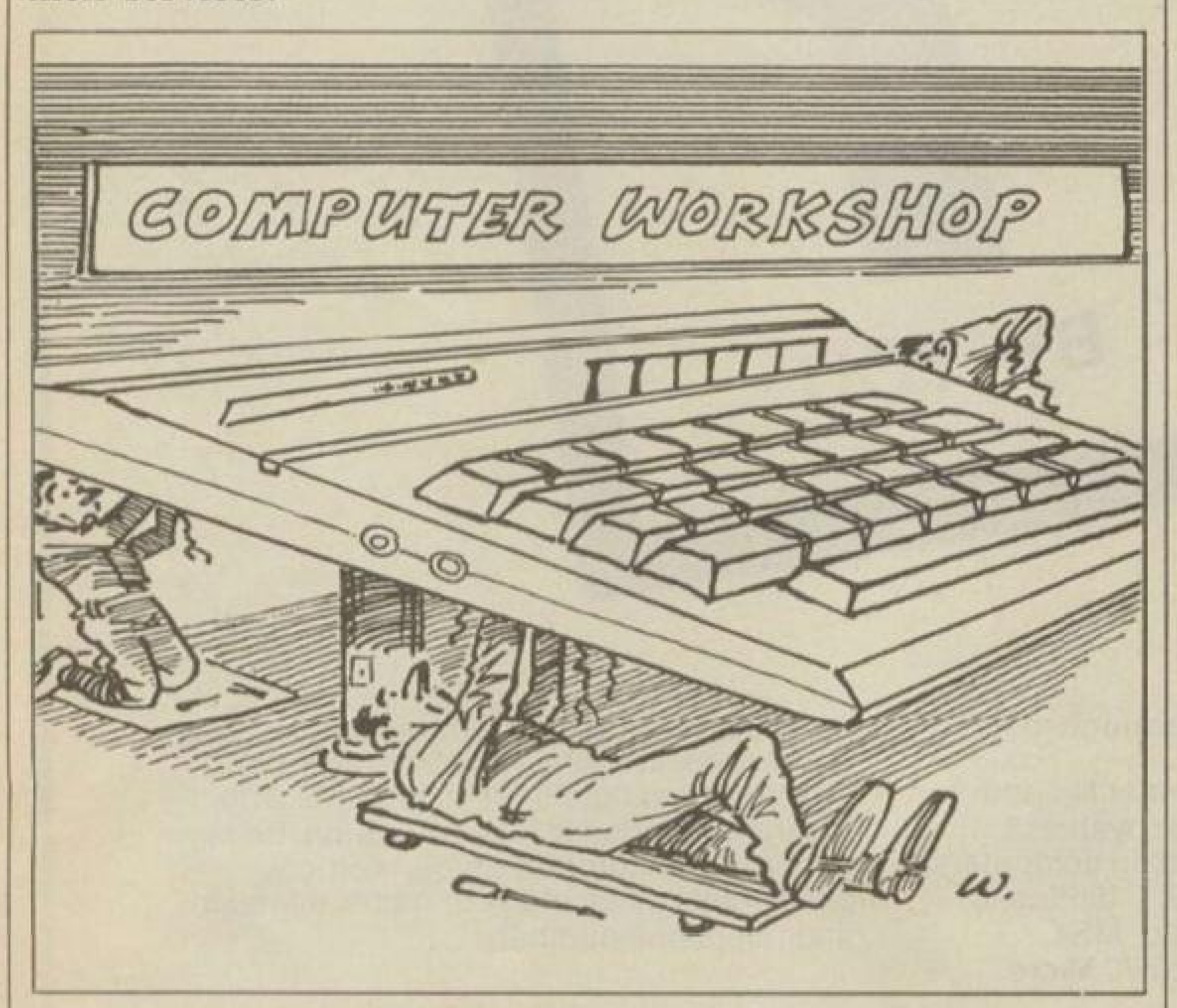
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Putting your computer back on the road



It is the one thing you hope will never happen to you. One fateful day, having switched-on your computer and monitor, you are faced with a blank screen. Despite the manufacturer's claims of superb reliability, computers malfunction. Connections break, fuses blow and the result is a non-functioning piece of equipment of little use to anyone. Companies exist which offer to repair your computer. We visited nine and compared their services.



Micro Mend

Micro Mend, a Peterborough-based repair company, has recently introduced a fixed-price range for all repairs on computers. The price includes not only parts and labour but also the cost of return postage and insurance. The average time taken is about two days and the charge varies from £16.95 for a Spectrum to £34.95 for any of the Amstrad CPC range.

The majority of the work arrives by post but several local people deliver their machines personally, although there is no reduction in price. When sending a machine, Micro Mend recommends wrapping well to avoid breakage. In some cases, it has received machines with cracked cases because of poor preparation but, with few exceptions, the company will replace them at no extra cost. In addition to the popular makes, most computer peripherals are repaired. Throughout the range all work is guaranteed for three months.

Micro Serv

Micro Serv claims that it can repair any computer from a ZX-81 to an Apple II. It has no fixed price scale; costs are calculated on the basis of parts used and time taken to carry-out the repair. The average price for a Spectrum, the computer repaired most commonly, is between £19 and £21 but does not include postage or insurance.

Based at Cumbernauld, near Glasgow, most of the work is delivered personally and many dealers in the area take their faulty products, glad of the 10 percent discount offered. The three working staff will give free estimates for repair and with some simple jobs it often needs only one hour to have the machines ready to be collected.

MP Electronics

A good deal of MP Electronics work involves repairing Spectrum computers which have been damaged by the interface being pulled out when the machine is still switched on. Because of most of the faults being similar, the company makes a standard charge of £20 for repairing a Spectrum. The price includes a complete overhaul, in which any work necessary to bring earlier models up to current specifications will be done. With other makes of computer, the range of faults is so wide-ranging that it is not practicable to offer a standard charge.

In addition to all the popular makes of computer, including mainframes, MP will also repair disc drives, printers and other peripherals. Most repairs are completed within 48 hours and the company's three-month guarantee covers not only repair but the entire machine. The company also offers a Freepost service, allowing customers to send their machines free.

Enfield Communications

Enfield Communications deals mainly with popular home micros. It can repair larger machines but they are normally sent

to contract engineers and therefore take a little longer. There is no fixed price scale for repairs, though most repairs fall between £20 and £30

Most work is completed within 48 hours but the company prefers not to guarantee completion in a set time, as unforeseen complications may cause delay. All machines are tested extensively, sometimes for several hours, before being returned by first-class post to their owners.

Essex Computer Centre

As with most computer repair companies, Essex Computer Centre also repairs many peripherals. Unusually, it offers to service any disc drive for £10. That involves stripping and re-building the drive, correcting any faults in the process. Being a high street store, it finds that most of its work is delivered personally by many of the home users in the Hornchurch area.

Repairs are completed within a maximum of three days and all work is guaranteed for between three and six months depending on the type of repair. For a Spectrum, where most of the faults tend to be similar, the average charge is around £20. For other machines the cost depends on the time taken and the parts needed to complete the job.



Video Vault

One of the biggest computer repair companies in the country, Video Vault specialises mainly in Spectrum and Commodore machines and its 30 staff handle around 600 machines a week. About half of the work arrives in the mail from home users. The other half is from contract work with dealers, schools and universities.

As well as repairing computers, the company sells a complete range of components and spares from keyboard membranes to upgrade kits. For £19.95, a Spectrum computer is repaired and fully serviced. The average price of a Commodore repair is £35.

Video Vault guarantees that all repairs will be completed within 24 hours and repairs are guaranteed for three months. In the near future it plans to open a second workshop in Manchester.

Capital Computers

Capital Computers finds that it deals with a very wide range of repairs, especially among the Commodore machines. It has a fixed price for Spectrum repairs of £17 including return postage but for other machines the cost varies too much to make it practicable to offer a fixed price scale.

Based in Cardiff where many computers are assembled, many of the staff are experienced engineers recruited from the manufacturing plants. Many customers deliver their machines personally, so Capital Computers has a separate waiting room in which they can wait while an estimate is made or repair is being effected.

Some repairs are completed the same day while others, because of extensive diagnostic testing, may take a little longer, up to a maximum of 72 hours. All work is guaranteed for three months, covering not only the repair but the entire machine.

Micro Support

Micro Support offers a fixed price scale for the more popular makes of home computer. It varies from £18 for a Spectrum to £32.50 for an Amstrad 464 or a BBC model B. For the more obscure makes of computer the work is charged according to the numbers and type of parts used. Most repairs are completed within three days and are guaranteed for three months. In addition to home micros, Micro Support also offers a technical support service for business computers and will collect and deliver machines in the area. A full range of printers, disc drives and other peripherals are also repaired.

L T Weston

For £12, L T Weston will repair any Spectrum fault and guarantee the work for three months. Specialising in video and television maintenance, repairing computers began as a hobby for the owner but now forms a major part of the workload. Most computers are sent by post, suffering from faults such as faulty ROMs or worn membranes.

Repairs are usually completed on the same day and the machines are returned by first-class mail. A full range of Spectrum peripherals is also repaired and, in the near future, the company hopes to extend its range to Commodore computers.

Capital Computer Services,
Unit K2 Cardiff Workshops,
Lewis Road,
Cardiff
CF1 5EG.
Tel: 0222 614401.

Essex Computer Centre,
174 High Street,
Hornchurch,
Essex
RM12 6QP.
Tel: 04024 75613.

Enfield Communications,
135 High Street,
Enfield,
Middlesex.
Tel: 01-805 7434.

LT Weston Electronics,
Unit P2A,
Avonside Enterprise Park,
Newbroughtan Road,
Melksham,
Wilts.
Tel: 0225 705017.

Micro Support,
Unit 3,
13 Springfield Road,
Harrow,
Middlesex
MA14 1QF.
Tel: 01 863 7166.

MP Electronics,
Freepost,
Dereham,
Norfolk
NR19 ZBR.
Tel: 036287 327.

Micro Serv,
Westfield Industrial Area,
Cumbernauld
G68 9HN.

Micro Mend,
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Going fo

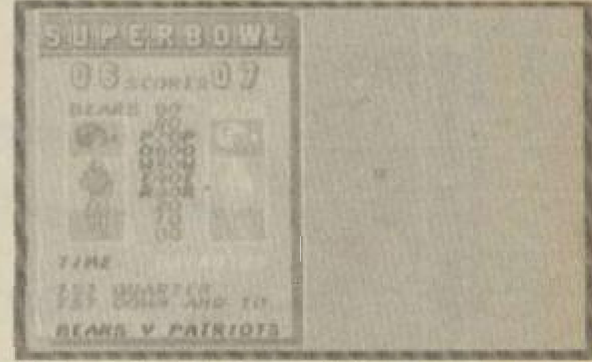
Sports simulations have been a mainstay of the games market ever since Track and Field hit the arcades. Francis Jago hops, skips and jumps his way through a selection of the best.

Ian Woosaam.

When Nolan Bushnall invented the *Pong* computer game in 1971 he can scarcely have imagined the effect it would have on a whole industry. Not only did he start the massive trend for computer games of any kind but he provided everyone else with ideas on which to base their games.

It was without question the arcades which really set sports simulations going, between two and three years ago. Although people had produced versions of tennis, squash and table tennis, they all tended to be re-hashes of Pong, with slightly different graphics. The real change was in mid-1983 when, out of the blue, Konami released *Track and Field* on an unsuspecting arcade-playing public.

Track and Field, and its subsequent derivatives, became one of the most popular games of all time and it was therefore not surprising that many home computer software houses took note. Activision, at that time not a well-known company in the U.K., was the first to take advantage of the success of Track and Field by releasing *Decathlon* for the



Commodore 64. Sales of the game were staggering and it can fairly claim to have started the joystick-snapping antics which have so affected computers recently.

Decathlon involved taking part in 10 sporting contests based on the Olympic event, with high scores achieved by combining skill with dexterity. Clever use of sprites and animation made the game a standard against which others should be judged.

Soon after the Activision game, Ocean released *Daley Thompson's Decathlon* for the Spectrum and Commodore. Although it lacked the originality of the Activision game, it managed to resemble the arcade game more closely and consequently soon reached number one.

Although arcade clones were the order of the day, the ideas behind sports simulations were far more wide-ranging. It was during that period that Addictive





gold

Games released *Football Manager*. Although it was much more of a strategic simulation, it has continued to sell well for more than two years and will always be remembered as a true classic.

Football was also the inspiration for another classic. Released originally only on cartridge, *International Football* for the Commodore 64 is still the game against which all football games are judged. Graphically unexceptional, it had the rare ability to fascinate at first glance. That, combined with a fun two-player mode, made it one of the biggest cartridge-based games and it still sold well when it was released on cassette six months later.

Most outstanding

It was during that period that U.S. sports simulations, excluding the already hugely-popular Decathlon, started to make an real impact. The most outstanding was *Summer Games* by Epyx. Imported by what was then Quicksilva, it did not sell well, mainly because it was available only on disc, but was technically the best multi-event game yet. Combining such diverse sports as diving and running, together with elaborate opening and closing ceremonies, it was what everyone expected of U.S. games – over the top.

One company from across the Atlantic which was having more success was Activision. Using its base in London, it released a series of sports simulations for the Commodore 64 and Atari 400/800 which, although based on U.S. games, managed to sell well on the back of the already successful Decathlon.

Although most of the games were available only for the Commodore, conversions not being so profuse as now, the Sinclair Spectrum also received a fair amount of attention for sports games. As well as the Ocean Decathlon game, Psion released *Match Point*, a sensational tennis simulation which took the world by storm. Using a 45-degree viewpoint and allowing the player to smash, lob and volley, Match Point was, for its time, the most impressive game on the Spectrum and shops all over England sold out within minutes.

With the demand for sports games increasing, more and more weird and wonderful simulations were being released. Another trend was motor racing simulations. Although there is a fair amount of argument about which company released the first three-dimensional car racing game, it was undoubtedly *Pole Position* by Atari which created the most stir. Its cockpit view, together with realistic turns and signposts, led to many derivatives, of which *Pitstop II*, the U.S. Gold split-screen game, proved to be the most playable.

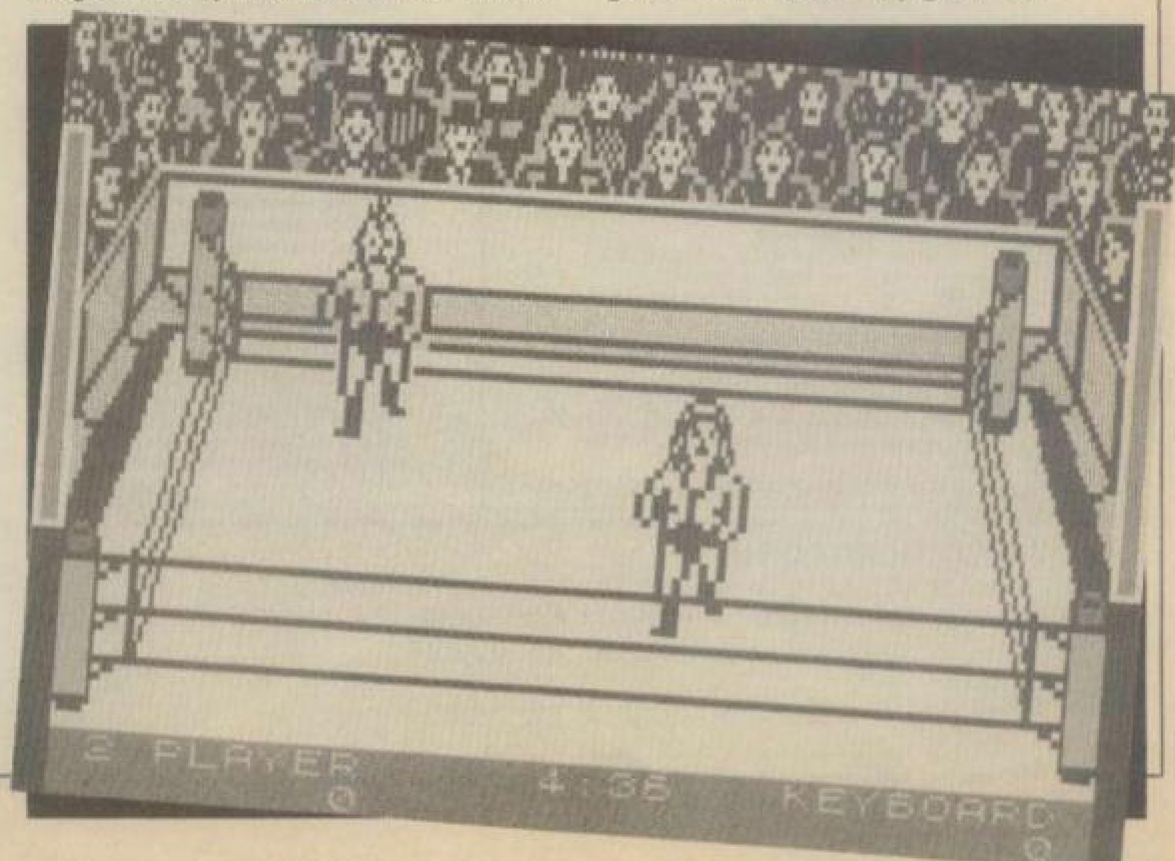
As motor simulations became more and more common, people searched for variations. Eventually this genre of sports game finished with *Revs* on the BBC. Programmed by Acornsoft, it was without question the most realistic driving simulation and still has a dedicated following.

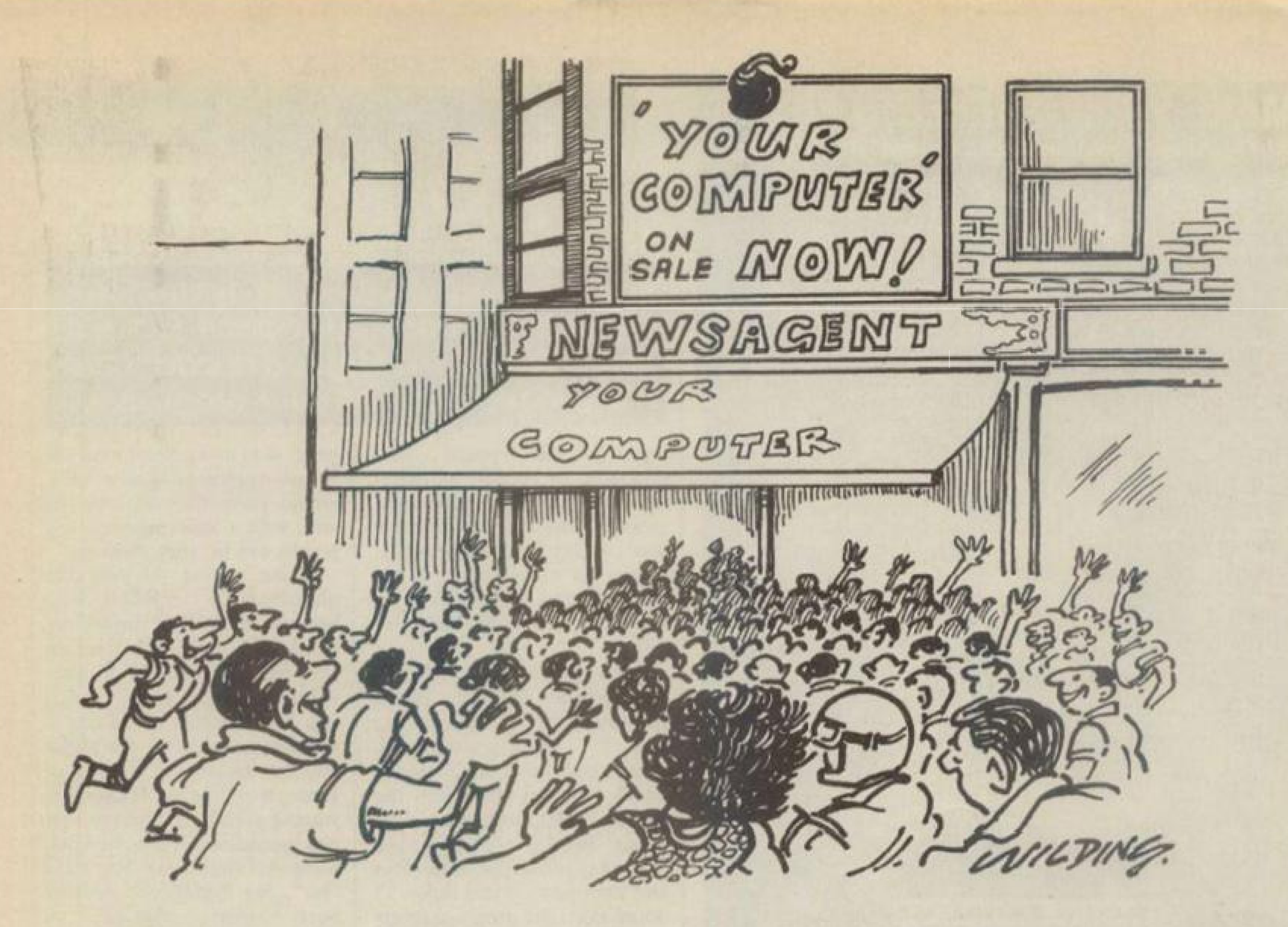
As programmers looked for more and more diverse sports to computerise, the arcade trend for fighting and martial arts games seemed the natural route. Alligata released *Knock Out* and shortly after both Elite and U.S. Gold released boxing simulations. After those games, subjects such as surfing, volleyball, golf and baseball have all been converted successfully to a variety of home computers.

More improvement

Even approaching Christmas, 1985, sports games were still selling in great quantities and when U.S. Gold released the Epyx *Winter Games* across all formats, it sold more than 150,000 copies. In 1986 there has been a distinct slowing in the appearance of new sports simulations, with the notable exception of combat games. What might re-kindle interest is a new release by Epyx. *World Games* promises to be the best yet, with new events, better graphics and more game play.

Although slightly lacking in originality now, sports simulations are still a sure-fire hit. As each new sport is converted, better graphics and more sound are incorporated, to make each game better than its rivals. If the trend continues, the sports may become more diverse but the games will undoubtedly get better.





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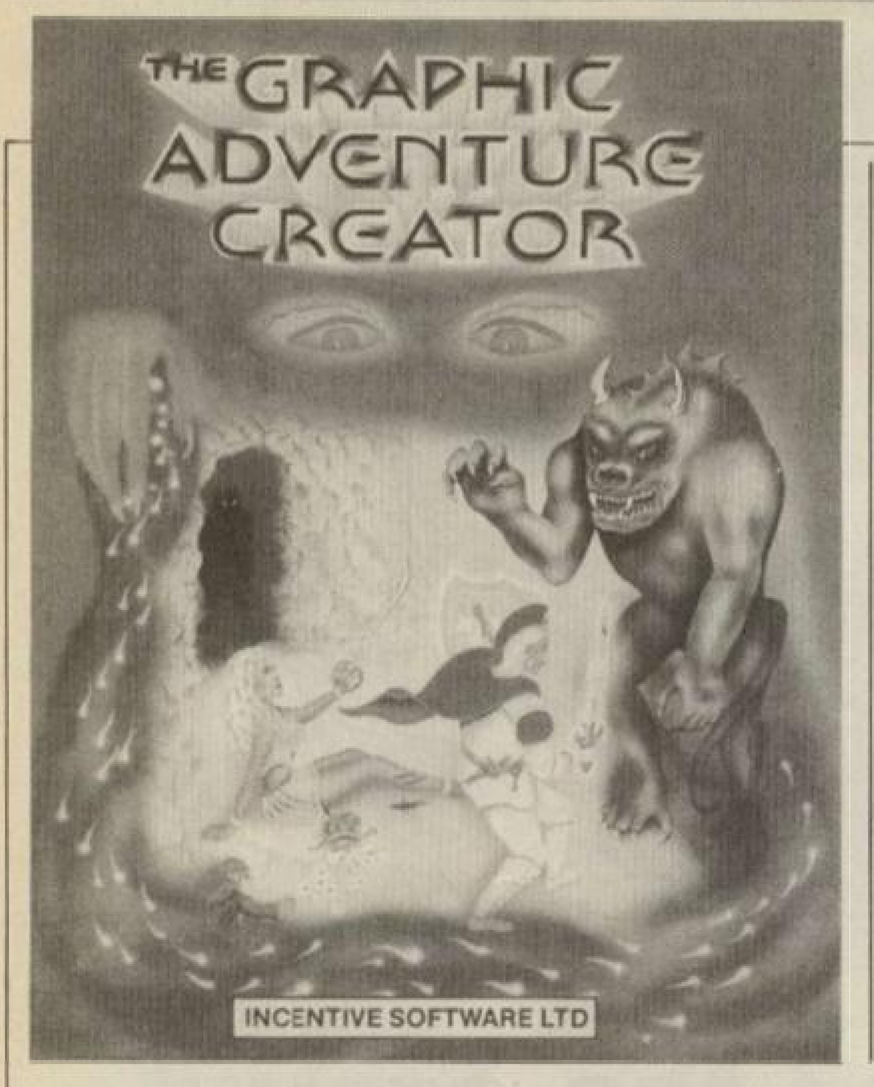
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Adventures in prog

From moving pictures to synthesised speech, Anthony Thompson looks at some software designed to add a professional touch to your programs.



Few of us are born without potentially great programming skills. Some will be happy with their best efforts, others will despair and a few will spend many unhappy hours at the keyboard wondering how best to animate a particular sequence, initiate a certain response, or produce the desired sound. During the last few years, however, the software industry has become increasingly aware of the growing demand for utilities to assist in Basic and machine code programming and many packages of the type are available.

Initially, toolkit packages were produced. They provided the user with additional graphics or sound commands which would allow the drawing of circles, ellipses or other shapes by inputting a few co-ordinates. Later, more specialist packages allowed the user to design sprites or scrolling backgrounds using simple menu-driven procedures.

As adventure games became more popular, utility programs to assist in their creation reached the marked and, with the advent of the text and graphics adventure, many were upgraded to permit the addition of pictures to text.

All those programs permit an average programmer to produce games of professional quality, as sequences of animation or sound can be saved and used as part of your programs.

Although no royalties or fees need to be paid to the company which developed the software, all insist that, should you intend to sell the program commercially, you should mention that it was written with the aid of the company's utility. Many offer a criticism and assessment service for all programs written with their software which could lead to publication and royalties. We look at some of the sound and graphics utilities available and compare the results.

Upper limit

Speech is a software speech synthesiser available for Amstrad, Commodore and BBC computers. By converting English words into phonems or speech particles, the program allows your computer to say anything regardless of length or complexity. Once the main program has loaded, two commands can be used to make the computer talk.

Both need to be preceded by a "|" (shifted @). The first is the |say command. By entering |say, " " the computer will speak any word or sentence which appears between the speech marks. using the command, Speech translates the lines of text into phonetic form and then pronounces them. In doing that, the program refers to a file dictionary which stores the correct pronunciation of several words.

The English language has more than 2,000 exceptions to its rules of pronunciation and, naturally, the Speech program cannot store all of them. Therefore, when using the |say command, some words may be badly mis-pronounced and sometimes more than a little difficult to comprehend.

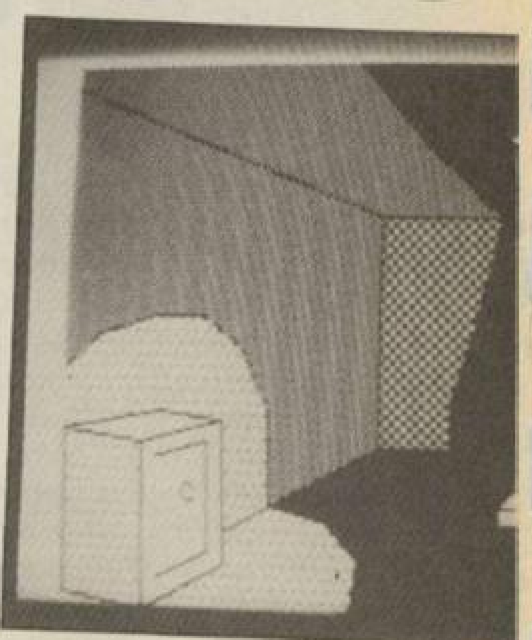
In-betweening

The |say command, however, allows a limited amount of control over the spoken word. A comma, hyphen or space causes the computer to pause while speaking. A full-stop at the end of a line lowers the pitch of the last word and a question-mark raises it.

Digits between 1 and 9 are recognised and pronounced properly when using the command. An edit function allows you to add new words to the dictionary or delete ones which you do not require and that can improve the diction of the |say command.

Far more impressive and a good deal more flexible is the |speak command where individual phonemes are spoken and, with a little practice, the results can be very pleasing.

A list of the 49 available phonemes is included with Speech and allows almost any word to be pronounced properly. The pitch of individual phonems within words can be adjusted by adding a number to the end so that stress and intonation can be added. It can, however, be a time-consuming process to find the best pronunciation for a word when using this command. The word "let", for example is spoken best when entered as "lai5ai4t". The pitch of an en-



tire sentence can be adjusted using the |pitch command, followed by a number between 1 and 20 to precede a |say or |speak instruction. At 20, the voice resembles Minnie Mouse while at 1 it is reminiscent of Frank Bruno.

In addition to the Speech program, five other files are included. There is a demonst-



ration of the Speech program where text is printed on-screen and spoken simultaneously, it is rather disappointing as the |say command is used and some of the words are badly pronounced.

Perhaps the most interesting of the extra programs is Sayfile which speaks the contents of any document file. A full set of comprehensive notes on using Speech and incorporating it as part of your programs is also included and can be printed on-screen or dumped to a printer.

Overall, Speech is a superb utility and can even be used to produce weird sound effects for your programs. Offering similar quality to far more expensive systems, Speech is out on its own.

The Quill is an adventure-writing system which allows someone with very little programming experience to write a professional-style adventure game. Information for the adventure such as a location description or a direction is stored in a database which is the heart of the program. An editor enables data to be added or deleted to and from the database, while an Interpreter extracts information from the database when running an adventure.

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NAME	PRICE TAPE	DISC	MACHINE RANGE
The Graphic Adventure Creator	£22.95	£27.95	BBC, Spectrum, Amstrad, Commodore
The Animator	£14.95	£17.95	Amstrad CPC only
The Quill	£14.95	£17.95	BBC, Spectrum, Commodore, Amstrad
The Illustrator + Quill	£22.95	£27.95	Spectrum, Commodore, Amstrad
Speech	£9.95	£11.95 (£14.95 Amstrad)	Amstrad, BBC, Commodore

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Discovery Software
Alpha House
10 Carver Street
Sheffield
S1 4FS
0742 753423

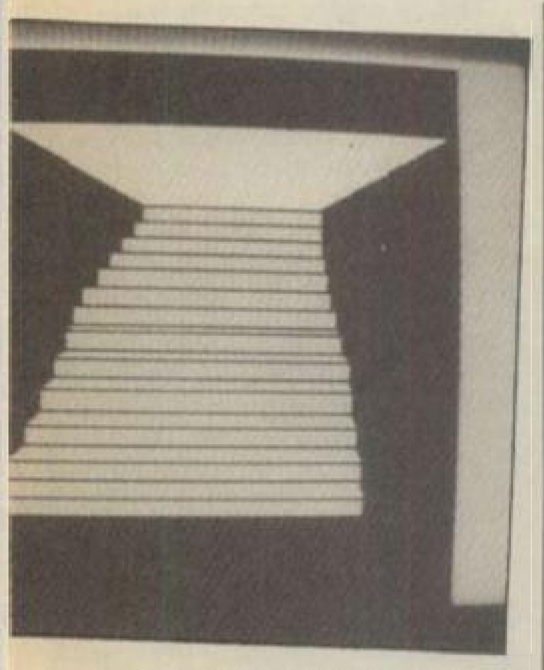
The Illustrator and Quill
Gilsoft
30 Hawthorn Road
Barry
South Glamorgan
0446 732765

Speech
Superior Software Ltd
Regent House
Skinner Lane
Leeds
LS7 1AX
0532 459453

The Graphic Adventure Creator
Incentive Software Ltd
54 London Street
Reading
RG1 4SQ
0734 591678

The combined Quill and Illustrator package is currently on special offer at £16.95 for a cassette and £18.95 for the disc version. The offer ends September 30th.

ramming practices



The manual is very comprehensive and easy to follow. A sample mini-adventure is included in the first chapter and is the perfect introduction to the working of the system. In the simple example, all you need do is input location descriptions and the possible directions of movement and The Quill does the rest. On testing the adventure, you find that, should you move in the wrong direction or enter a word not in the database vocabulary, the computer responds automatically with "I can't go in that direction" or "I don't understand".

Once you have reached that stage, you should understand how The Quill works and want to learn more. The manual then explains gently methods of adding more complexity to the adventure, showing you how to add more words to the database vocabulary, make messages appear during the adventure and how to allow objects to be manipulated. The sample adventure continues to develop in a manner which teaches you how to create almost any situation for which you could wish in your adventure.

The manual then gives tips on designing a game and even on selling your adventure. It would take only a short time for even a newcoimer to produce a high-quality product. It should be noted, however, that any adventure is only as good as its author's imagination, regardless of how well-structured it is.

Key frame

Designed to be used specifically with The Quill, *The Illustrator* allows the budding adventure writer to add detailed graphics to text. It is based on a database which contains the necessary drawing commands and an interpreter which interfaces with The Quill to produce pictures at the required locations. To create a graphics adventure using The Illustrator, you first need to write the text with The Quill. In the manual, the sample adventure from The Quill, recorded after The Illustrator, is used to show how to add pictures to text using the system.

By moving a cursor round the screen, lines can be drawn and boxes can be filled or shaded in varying colours and densities until you create the desired scene. One interesting feature is the ability to create a standard picture and then reproduce it in any number of other pictures, a useful feature if any items are to be repeated at other locations, such as doors or windows. The upper limit of 254 pictures should be sufficient for even the most ambitious adventure writers.

Limitations

The Illustrator is the ideal complement to The Quill for any serious adventure writer but it is not the perfect drawing system. It has no box or circle commands, so creating even a simple picture can be a long process.

Another program called *The Splitter*, included with The Illustrator, is needed to split the

Contined on page 38

Continued from page 37

screen so that text and graphics can be displayed together. It allows you to choose the number of lines the picture occupies, having the picture permanently on-screen or having it removed at the "more . ." prompt which appears when there is too much text to occupy the space left by the picture. In that case, the picture can be recalled using the "look" command.

To create the impression of smooth, continuous movement in a program is a difficult task, even for the relatively experienced programmer. *The Animator* is the latest release from Discovery, the utility label of Gremlin Graphics. It allows animated sequences to be created from just two or, in some cases, one drawing. The program works on a similar principle to a cartoon.

There, many hundreds of slightly different pictures are used to give the impression of movement. With The Animator, you need draw only the first and last pictures of the sequence. The program, using a process called in-betweening, then generates the missing frames. The complete sequence can then be run at up to 25 frames per second.

Tiny text

More than 20 drawing commands, including circles and polygons, can be used in creating the main or key frames. Those pictures can then be copied to another frame where they can be contracted, expanded, rotated or re-formed into a different pattern. If you wanted to show a character walking to a ladder and climbing it, you would have first to show him standing to one side of the ladder and then move to another frame to show him at its base.

A final key frame would then be needed to show him at the top of the ladder. If you drew only a picture of the character at one side of the ladder and then on top of it, the animated sequence would show him flying through the air to the position given in the last frame. It is important to remember that each key frame must have the same number of lines as the first or the computer will be unable to calculate the positions of the remaining lines when calculating the in-between frames. That problem can be overcome easily by super-imposing lines inconspicuously round the screen, thus allowing you to use additional lines in subsequent frames.

User-friendly

By positioning the cursor on the screen and pressing a few keys, it is possible to change the standard ink colours, fill-in shapes and even to view previous frames to check the number of lines. The finished sequence can then be saved to tape or disc. Towards the end of the manual is a description of how to incorporate those sequences into your Basic programs.

Although The Animator is a wonderful utility, its usefulness is very much dependent on the type of computer with which it is used. On the 464 and 664, there is only 17K of memory available for storing frames compared to 81K on the 6128. The number of frames you can fit into that memory varies according to the number of lines each frame contains.

An indicator on the main menu screen gives a rough indication of how much memory has been used and should prevent you running out mid-way through a sequence. Even the available memory may be limited on certain models in the Amstrad CPC range but there is no easier way of creating animation.

A direct competitor to the combined Quill and Illustrator package, the *Graphic Adventure Creator* is an all-in-one graphic adventure-writing system. It features a command interpreter capable of handling complex sentences and multiple command lines. It can also understand the word "it" and therefore allows the user to use commands like "Pick up the box and open it", as with many professional adventures.

Uninviting

The manual is more than a little uninviting, having been printed in small, closely-packed text, but the content is sound. In a similar way to The Quill, a sample adventure is included in the first chapter but it is used to show the correct structure of an adventure rather than to teach the workings of the system.

Only on moving to the next chapter, which covers graphics, are you invited to switch on the computer and squint your way past the program's Lenslok protection system.

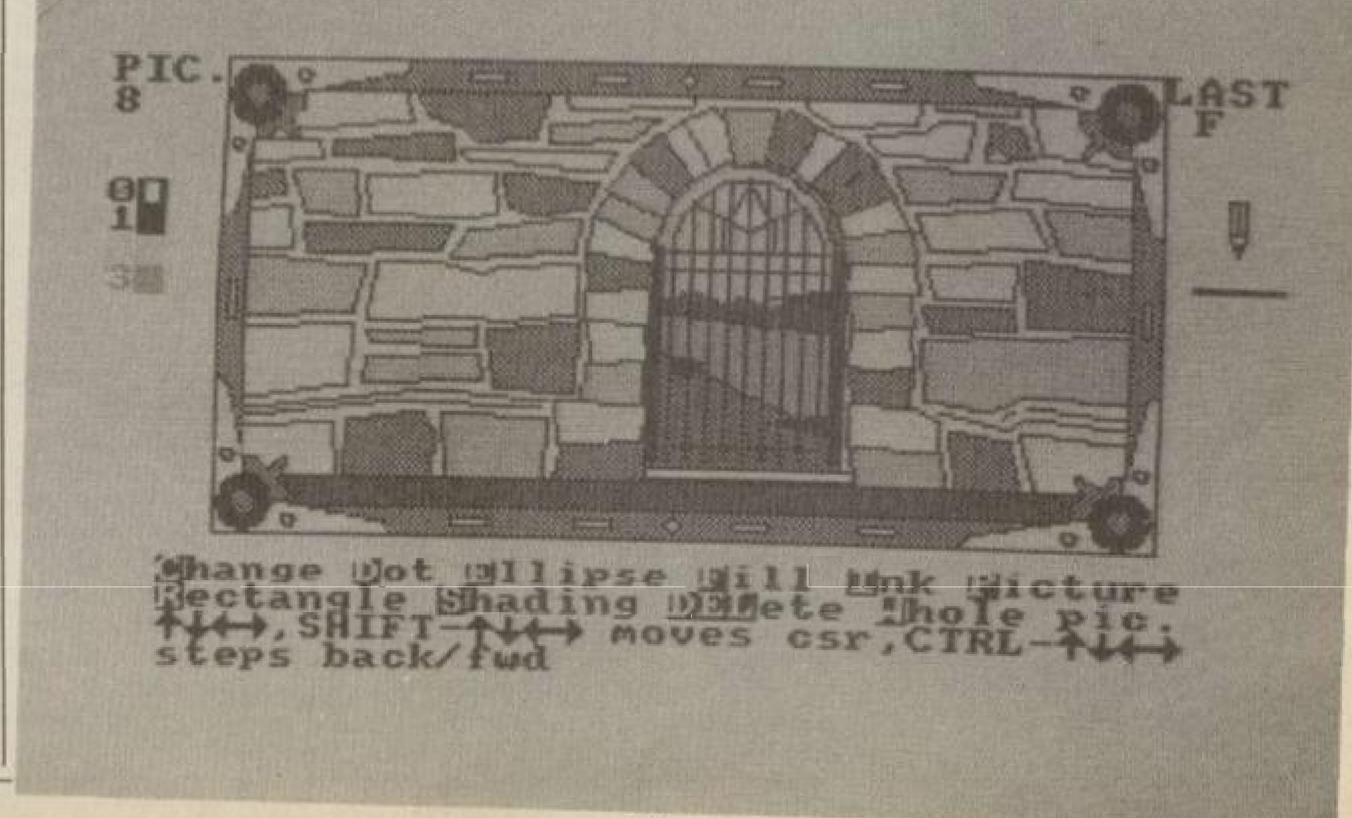
The picture window is small but the extensive range of drawing commands allows very intricate pictures to be created. Boxes and ellipses are drawn easily using a few keystrokes and areas can be shaded or filled in a choice of up to 27 colours. In addition to allowing more realistic pictures to be drawn, the wide range of commands add considerable speed to the process.

Useful

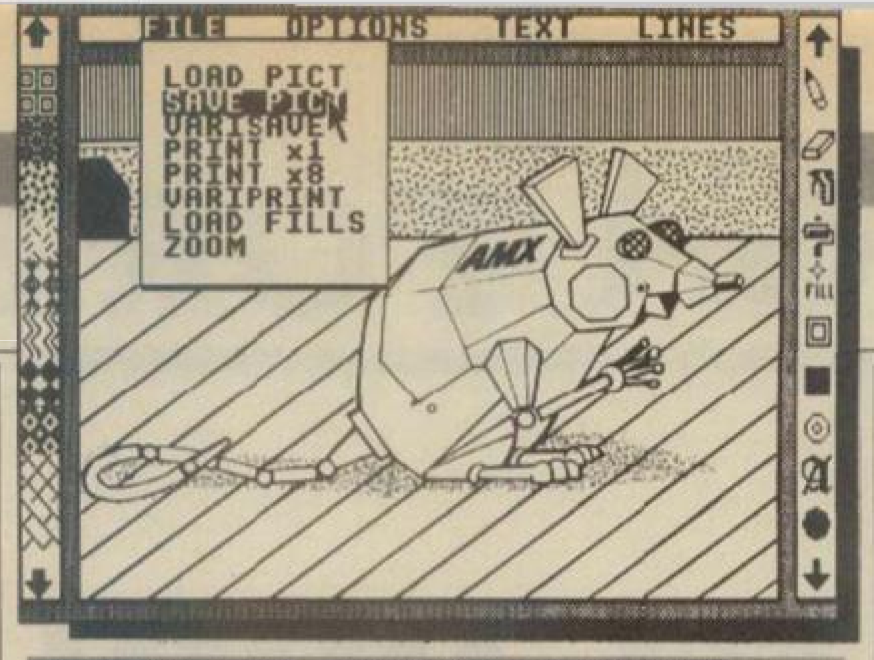
Using The Illustrator, for example, a circle would have to be drawn on a pixel-by-pixel basis, a process which uses a great deal of memory.

The manual has but one brief chapter devoted to graphics, designed to encourage the user to experiment. It then explains how to develop the adventure further with details about increasing the vocabulary, detecting words and producing messages. The manual is not so user-friendly as some available but, with a little perseverance, even an absolute beginner to programming can produce a very well-structured game with pleasant graphics.

The Graphic Adventure Creator is a useful utility for beginners and experts alike. It does the hard work and allows the user to concentrate on making the adventure as exciting as possible.



The drawing screen of the Graphic Adventure Creator.





Roger Garrett reports on utilities any good artist should not be without.

Graphics on the Amstrad

Graphics utilities are in many forms. They range from the basic draw-a-circle, colour-it-in-type through to those for the more serious, advanced user. We look at three types of drawing aids, The Mouse, The Graphpad and, finally, The Conventional manner, i.e., keyboard input.

Three ways of creating whatever your imagination allows, they do not represent the best of what is available – only you can be the judge of that. Suffice it to say they represent some of the graphics utilities which are available.

Of the three packages at which I looked I must confess the one which pleased me most in terms of user-friendliness was the AMX Mouse; combining ease of use with very good software, it offers the budding artist all that is needed to create excellent graphics on-screen. It will also allow more serious programmers to create their own designs for use in their programs.

Segments

On loading, you are presented with a well-defined art-screen. The screen is [illegible] into five segments [illegible] include the pull-down menu bars, the mode icons, the pattern bar, the currently selected pattern area and the drawing area. The pull-down bars are situated at the top of the screen and consist of four menus – File, Options, Text and Lines. By moving the mouse-controlled cursor to the bar of your choice and pressing the Execute button you are shown a graphic window listing the various commands.

On the far right of the screen are the mode and fill icons, which include the various icons for use in drawing circles, boxes, filling designs. The far left of the screen contains the pattern mode. Numerous patterns are available for your use or, if you prefer, you can design your own by using the pattern design grid. One really pleasant feature is the Zoom facility, which permits you to work on your picture in small areas at a time and helps to give it that professional touch.

I found the utility very easy to use and in no time at all I was drawing pictures. Even I was impressed with it and I am no artist. Overall this package represents everything the amateur and professional artist could require.

A different type of utility but offering similar characteristics [illegible] Graphpad 2. [illegible] complete [illegible] and software [illegible] ed [illegible] n. x [illegible] only [illegible] ay de[illegible] of the [illegible] ability to trace [illegible] pad, it means [illegible] need small [illegible] which [illegible]

Simplicity

This is by no means [illegible] function of the package. The ease of [illegible] of the pen, even though [illegible] resembles a large cigar, enables any[illegible] quickly to master the [illegible] to draw circles, triangles, polygons and ellipses and to produce reasonably good pictures.

To draw a circle is simplicity itself. After moving the pen to the appropriate icon on the pad, you press a button located on the pen, move the pen to where you want the centre of the circle, press the button again, move the pen to the desired radius, once more press the button and your circle is drawn.

Erasing is achieved quickly by selecting the rubber icon, then the size of rubber required, i.e., small for detailed erasing and in varying thicknesses depending on what you want to erase. The use of a pen has slight advantages over the use of a mouse, mainly because you do not need a large working area but the [illegible] not so great as to [illegible] buying a mouse. [illegible] disadvantage [illegible] the Graphpad [illegible] the lack of a [illegible]ity. Other than that it is excellent.

The latest utility from CRL Group is called The Image System but that is the only simple thing about it. I am not saying that the package is difficult to use but mainly that it is a very powerful designing utility. All commands are controlled through the keyboard and even though that method is slow at first, using the keyboard permits perfect control of the cursor.

After loading you are confronted with a large drawing area. The bottom quarter of the screen contains the drawing menu. Most commands are accessed from there. Among the commands are the colour palette, showing 16 blocks of colour which are changeable. That allows you to use all 27 colours. A status window shows what command you are using and a memory meter informs you of memory used.

Other features include a Zoom, so close, precise work can be carried-out; Rotation, which is self-explanatory; there is also the ability to store up to 255 pictures in memory, which can be re-called at any time. One very good use is in the way you can give a shadow relief effect to your pictures, by using the define filters and transparent colours.

Filters

The way in which it is done is simple. Having created your graphic and coloured it, you then change the colours by using the filters. When that is done your graphic will be all blue – or whatever colour you want the background to be – but you still have the original picture stored in memory, so the first thing to do is make transparent the which border on the original. Then load the original on to the top of the shadow graphic, but moved slightly up and to the right, which gives the impression of the shadow relief – and very striking it is, too.

Each is superb in its own right. Each offers almost the same functions, even though they are carried-out in a different manner and with different degrees of sophistication.

AMX Mouse.
Advanced Memory Systems Ltd,
Green Lane, Appleton,
Warrington WA4 5NG.
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Price £69.95.

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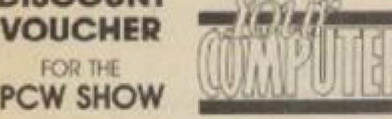

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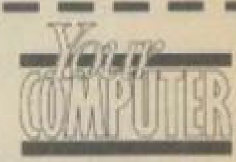

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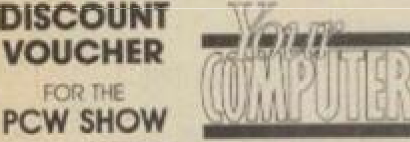
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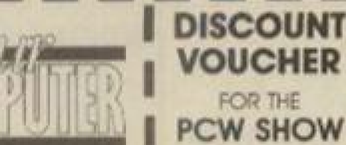
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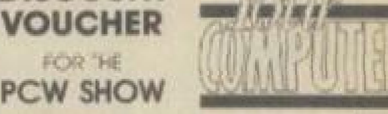
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PRODUCT: Any of Durell Software's current titles. **LIABILITY:** None.	**PRODUCT:** Pub games. Commodore, Spectrum and Amstrad. *Pub games. Seven game compilation featuring Bar Billiards, Table Soccer, Darts, Dominoes, Pontoon, Poker, Skittles, on one tape or disc.* **LIABILITY:** First 50 people.	**PRODUCT:** Selected products. **LIABILITY:** While stocks last.	**PRODUCT:** Graffics tablets and software. *For BBC, Amstrad, Commodore computers.* **LIABILITY:** None.
PRODUCT: Any product. *See our new range of products for the Amstrad, IBM, Spectrum and Commodore computers.* **LIABILITY:** First 150 people	**PRODUCT:** Brattacus, Deep Space, Arena. *See our two new existing products: Day Space and Arena at the Psygnosis stand, no 4127.* **LIABILITY:** None.	**PRODUCT:** Paper Boy. *An officially licensed coin-op version from Atari.* **LIABILITY:** None.	**PRODUCT:** All software and joycestick interface. *Visit our stand to see a flight simulctor and save £1. Also Joycestick interface for Amstrad 8256.* **LIABILITY:** None.
PRODUCT: Kirel. *An unusual 3D arcade game available on Spectrum and Amstrad.* **LIABILITY:** None.	**PRODUCT:** Up to £2 off selected edge products while stocks last. **LIABILITY:** None.	**PRODUCT:** Thingi. *If you miss us at the show order direct on 051 647 8981.* **LIABILITY:** For first 100 visitors who produce this ticket.	**PRODUCT:** 125 Joystick. *As a special show offer, Cheetah are offering £1 off their 125 Joystick – U.K's top selling stick. Compatible with Spectrum, Commodore 64, Amstrad, Atari, MSX etc. Four fire buttons, auto fire, 12 months warranty. R.R.P. £8.95.* **LIABILITY:** While stocks last.
PRODUCT: £5 of R.R.P. Magic Disk Kit. *Commodore 1541/1570 disk drive. Remedy head alignment problems easily. Have speed test, alignment test and head cleaner.* **LIABILITY:** While stocks last.	**PRODUCT:** £2 off Action Reflex (Spectrum). *Crash: "This game has a really good feel about it that keeps you playing; there are lots of nice graphical touches which help . . . a very playable and addictive game which I can recommend strongly. overall value 8890."* **LIABILITY:** None.	**PRODUCT:** £2 off 811 – Combat (Spectrum and Amstrad). *Amstrad user: "The sound effects in this game are very good with a realistic squish when your stick makes contact with your opponent's eyeball . . . I think this is the best combat game of this genre that I've seen and you should all go out and buy it."* **LIABILITY:** None.	**PRODUCT:** £1 off selected show games. **LIABILITY:** None.
PRODUCT: With first year's subscription to Micronet and Prestel. Modem for BBC and Spectrum owners. *For all other micro owners £10 off their first quarter's subscription to Micronet.* **LIABILITY:** None.	**PRODUCT:** £5 off show price. Atari ST products. *Offers applies to back pack and fast Basic.* **LIABILITY:** None.	**PRODUCT:** £3 off Miam Vice computer game. *Join Crockett and Tubbs under cover in this actiuon packjed arcade-adventure. Encounter the world of low life dealers and slick business moguls and elicit contraband, as you gater evidence for the big bust.* **LIABILITY:** None.	**PRODUCT:** £2 off R.R.P. The Britestik Joystick. *A revolutionary new hand-held micro-switched joystick with built-in rapid fire option.* **LIABILITY:** While stocks last.

GUIDE TO THIS MONTH'S REVIEWS

Software Shortlist

Each of the games reviewed in Software Shortlist has been reviewed extensively by our team of reviewers.
We do not include reviews of unfinished products in this section of *Your Computer*; they are the games you can buy now or in the near future.
See the Software News and Preview features for advance news of games being developed.



Watch for the *Your Computer* Soft Stars. They are awarded to games which, in our opinion, offer outstanding value.

JACK THE NIPPER

► *Various ● Gremlin ● Arcade Adventure ● Francis Jago ● £8.95*

As all good boys know, laws are made to be broken. Working on that basis, the latest Gremlin release, *Jack The Nipper*, is an anarchist's delight. You play Jack. He is tired of all his pathetically weedy friends and decides to have some real fun. Unlike most nappy-clad children, Jack's idea of fun is not playing tag; he likes causing as much grief and despair as possible and he has a great talent.

Jack The Nipper is set in the area round his home. Each house or shop is depicted differently and each contains different objects, collectable or otherwise.

Once the game has begun, Jack must first find his trusty peashooter, which thankfully is nearby. By shooting various people, including the dog, cat, mum, dad, and everything else which moves, you soon discover the naughtyometer.

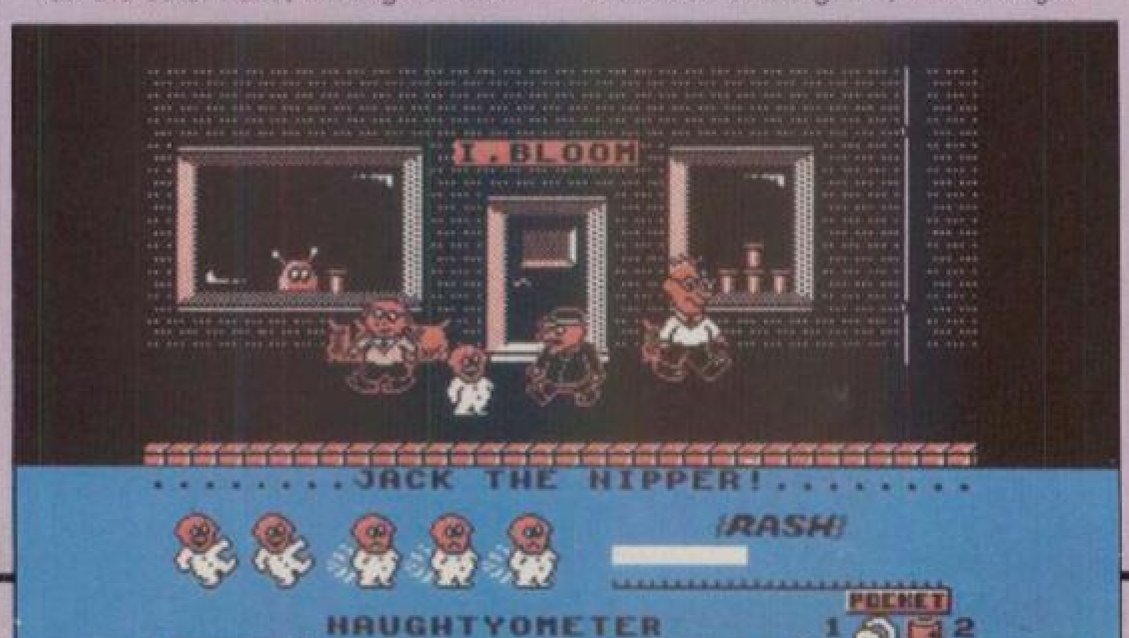
As with many of the earlier arcade/adventures, you are scored by percentage. Each activity you manage to disrupt has a different degree of naughtiness and they all total to a final percentage.

On the other hand, making contact with any of the other characters, and especially those whose lives you have disrupted in one way or another, gives you a serious case of nappy rash, which eventually becomes terminal. When you have lost five lives your overall percentage is given, together with an evaluation of the game, which ranges from Weedy Wimp upwards.

Both the animation and graphics are excellent. All the characters are well-defined and all the objects are easily distinguishable. To add to the game, there are two secret platform games hidden inside, one of which is fiendishly difficult.

Once you have appreciated the idea, everything about the game falls into place. No longer do you just smash things? No, nothing is too disruptive for Jack, as the police soon discover. This brings out the worst in every wonderful child – or adult.





FRANK BRUNO'S BOXING

► C16/Plus 4 ● Elite ● Simulation ● Ian Nicol ● £7.95



During its conversion to the C16 and Plus 4, *Frank Bruno's Boxing* has lost none of its original charm or appeal and still remains one of the best boxing simulations available.

You are in control of the immense power of Bruno as he attempts to punch, dodge and weave his way past three oponents, beating each one at light, middle and heavyweight before moving to the next on his way to winning the world championship.

Each of his opponents has a different fighting style and is supposedly more intelligent than the previous one. First is the Canadian Crusher, the kind of man who eats lumberjacks for breakfast, chain saws and all. Beating him pits you against the martial arts expert, Fling Long Chop, a fast, powerful man who eats noodles for breakfast. Should you survive his onslaught, Bruno will face the terrifying Andra Puncheredov. He does not eat breakfast.

The data for Long Chop and Puncheredov is stored on tape. After Bruno has beaten the Crusher in all three weight divisions, he is given a secret code to enable the others to be loaded. That means you cannot cheat and go straight to the final; you have to earn your place by beating all the other contenders, like the real thing.

Controlling the action is complicated; a joystick cannot be used and eight keys are needed to move Bruno. As each fight progresses, a meter displays the opponent's energy level. When that drops to zero, a flashing sign prompts you to try a knockout punch. To win Bruno must knock down his opponent three times.

The only slight disappointment is the sound. There is no incidental music and the sounds produced as the gloves connect would be more at home in an episode of *Batman* than this game. Other than that, the only thing missing from this superb simulation is the seemingly ever-present commentary of Harry Carpenter.

GRAPHICS
● ● ● ● ●
SOUND
● ●
PLAYABILITY
● ● ● ●
VALUE FOR MONEY
● ● ● ●
OVERALL
● ● ● ●

KNIGHT GAMES

► C64/Amstrad ● English ● Arcade ● Francis Jago ● £9



As with *Elektraglide*, the previous English Software game, *Knight Games* is a excellent idea, with flaws. Fans of sports simulations such as *Hyper Sports* will recognise the scenario instantly but not necessarily the events.

Set in the middle ages, Knight Games has eight events, each of which involves mastering skills not seen previously on a micro. If you can imagine a cross between *International Karate* and *Summer Games*, with armour, that is Knight Games.

What Knight Games lacks is the feeling of playability with games where skill is needed. In six of the eight events, the most effective policy is to move the joystick as fast as possible, not worrying about who or what is hit.

To get the most from Knight Games it is necessary to play against someone, not the computer, and even then, six of the eight events are relatively similar. One very redeeming feature is the sound. Knight Games features eight of the best soundtracks yet for the Commodore 64.

For dedicated fans of Kung Fu/Sports games, Knight Games will undoubtedly provide hours of fun; on the other hand it is unlikely that anyone else could justify the price.

GRAPHICS
● ● ● ●
SOUND
● ● ● ● ●
PLAYABILITY
● ● ●
VALUE FOR MONEY
● ● ●
OVERALL
● ● ●

WIMBLEDON

► C16/Plus 4 ● Gremlin ● Simulation ● Ian Nicol ● £7.95

GRAPHICS
● ● ● ●
SOUND
● ●
PLAYABILITY
● ● ●
VALUE FOR MONEY
● ● ●
OVERALL
● ● ●

Just when you thought that we had got rid of the tennis for another year; just when you thought it was safe to walk into a sports shop with no danger of having a salesman thrust the latest racquet up your nose, Gremlin has released *Wimbledon*. There is no need, however, to rummage in a cupboard for your designer shorts, socks and wristbands for now, even in the dead of night, sitting in a comfortable armchair with a bottle of barley water, you can still enjoy all the thrills and spills of tennis.



Before the game begins, an options menu is displayed. You can adjust the level of difficulty, the number of sets needed to win, the game speed or the number of players. In this simple-to-play simulation, the action is shown from a birds-eye view of the court. Shots are selected automatically in relation to the player's position compared to that of the ball and, by holding down the fire button, you can determine how hard the ball is hit and where on the court it lands. So, with a little practice using a combination of delicate control and appropriate positioning, it is possible to outwit the opponent and win the championship. The wide variety of skill settings means that even when you have conquered one level, more challenges await you.

The graphics are very impressive, worthy of a machine with a memory far greater than that of the C16 but, once again, the sound suffers as a result. The game is great value and, being almost as addictive as the rea thing, it is bound to be popular with many C16 and Plus 4 owners.

THRUST

► *BBC ● Superior ● Arcade ● Francis Jago ● £7.95*

It is not often that budget games are converted from the BBC and it is even rarer that they are then released at full price. *Thrust* is just such a game. Starting as a Firebird Silver range game, it was such a hit that Superior Software bought the BBC rights and has now released it.

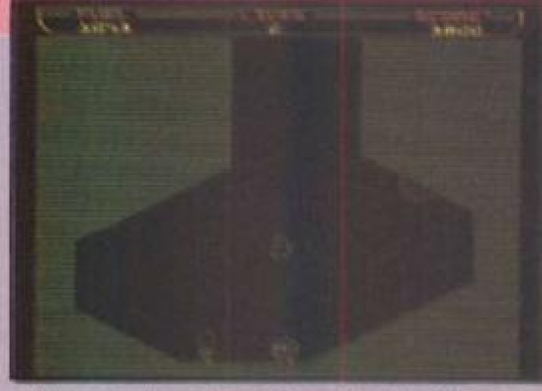
In many ways Thrust was a surprise hit. Based on a really early arcade game, *Gravitar,* it had no fancy graphics or sound – just an amazing degree of addictiveness.

For youngsters who never played Gavitar, it was an asteroid-type game, in which your spacecraft must fly to the bottom of various mazes, collect the Klystron pods, and then fly back to the surface. Unfortunately, the pods are connected umbilically to you and are very heavy.

Flying through the maze is complicated further by the occasional missile base, which must be shot. BBC gamesters used to meteors will find the keys very easy to learn, although the feeling of gravity will be, to say the least, disturbing.

Superior Software has set up a competition for everyone who gets past the 24th, 48th and 72nd levels but that will take a long time. Graphically, Thrust is well-suited to the BBC but there is nothing at which to marvel.





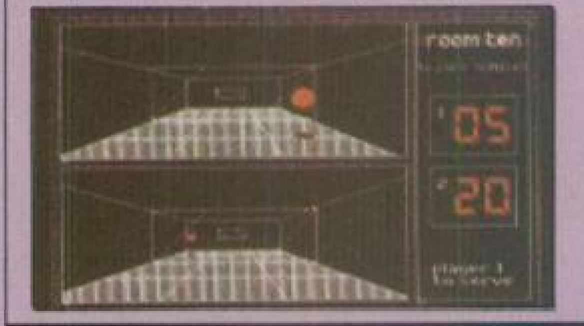
Where Thrust stands out from almost all other games is during play. It is a game which, like most arcade games, requires practice but when you finish the Xth screen it is vastly rewarding. Dedicated BBC games fans would do well not to miss this one; it is bound to be remembered as a classic.

ROOM TEN

► *Amstrad ● CRL ● Arcade ● Francis Jago ● £8.95*

Tau Ceti was without doubt one of the best games designed originally for the Amstrad. Programmed by Peter Cooke, it combined spectacular graphics with strategy to produce a game which made *Elite* look poor in comparison.

With *Room Ten,* his latest game, Cooke has stretched a simple idea way beyond its limits and surprisingly produced another great game. Room Ten is based on *Pong.*



Instead of the original, two-dimensional overview, Room Ten is a split-screen, three-dimensional game. Each player controls a transparent bat with which he must prevent a ball hitting his back wall. The two views show the ball from the viewpoint of the player and the opponent, with player one controlling the top half of the screen.



To make the game more complicated, the room has gravity and angles are reflected extremely accurately. Each time a player manages to hit his opponent's back wall, five points are scored with the winner being the first player to reach 35 points.

Using three-dimensional vector graphics, Room Ten manages to create an eerie sense of reality.

As well as being able to play against a human opponent, Room Ten permits competition against the computer at various levels, from relatively slow, and therefore simple, to fast and extremely difficult.

Recommending Room Ten is easy. It is simple to learn, yet difficult to master, and is another must for Amstrad owners.

ACE

► *Spectrum ● Cascade ● Simulation ● Francis Jago ● £9.95*

Spectrum owners have scarcely been deprived of high-quality simulations. Games such as *Tomahawk* and *Turbo Esprit* have managed to capture the imagination of more than just avid simulations players. Mainly that was because they managed to involve the player.

In *Ace,* a recent conversion from the Commodore 64, Cascade has managed to create one of the few flight simulators which is truly enjoyable to play, either for a few minutes or a few hours.

GRAPHICS
● ● ● ●
SOUND
●
PLAYABILITY
● ● ● ●
VALUE FOR MONEY
● ● ● ●
OVERALL
● ● ● ●

As is normal with games of this kind, the Ace scenario involves saving the world from all kinds of evil marauders but what makes Ace more than just a flight simulator is that you must shoot a variety of enemies while retaining complete control of your All Weather All Terrain (AWAT) jet.

One criticism levelled at Ace is the inclusion of a Lenslok protection system. However clever the system is, it is also difficult to use and as such should be avoided if possible.

Having chosen the mission on which you wish to embark and whether or not you will be using a weapons man, you set out on a series of sorties which permit you gradually to improve your flying skills as you progress through the levels.

The AWAT control panel occupies most of the lower half of the screen, with an assortment of dials and radars, while the upper half of the screen acts as a window on the action. To make playing Ace easier, pressing M reveals a map of the coastline you are defending, highlighting both your aircraft and, more important, the enemy.

Ace represents something new. It is a simulation to appeal to arcade addicts as well. This combination is refreshingly novel, especially for Spectrum owners, and as such it deserves to be a hit.



SOFTWARE SHORTLIST

TRASHMAN

► *Amstrad ● New Generation ● Arcade ● Francis Jago ● £7.95*

Have you ever fancied being a *Trashman?* If the answer is yes, this release from New Generation, the first after its recent sale to Virgin, gives you the chance. Whether a chance you will want to take is another matter.

Released originally for the Spectrum more than a year ago, Trashman received almost endless praise but this conversion leaves a great deal to be desired.

Trashman is a one- or two-player game which involves travelling up and down various streets, collecting a specified amount of bins within the time limit. To keep up your time limit and consequently earn a bigger bonus, extra jobs, such as calming distraught housewives, can be performed.

Life, however, is not all a bed of roses. If, while controlling the trashman, you tread on the grass of a home, it is likely that a dog will charge out and chew a few limbs. Injuries such as that and being hit by bicycles slow movement considerably. Another major hazard is crossing the road to reach more houses; collision with a car is terminal.





Where Trashman fails, and indeed where a number of games by Virgin fail, is not the idea but the execution. As a machine, the Amstrad is much more powerful than the Spectrum, yet Trashman fails to make the most of any of the Amstrad features. Neither the graphics nor the sound are better than the Spectrum version and that is a pity.

Whatever its failings on the Amstrad, Trashman is still a highly-enjoyable game. It combines a really good idea with a witty storyline but unfortunately results in an extremely disappointing finished product.

DRAGON'S LAIR

► *C64 ● Software Projects ● Arcade ● Francis Jago ● £9.95*

Not very long ago, in a not very magical time, *Dragon's Lair* ruled the arcades. The game was the first to use videodisc projection and, using those techniques, had the most cartoon-like graphics and animation ever seen.

It was because the graphics and sound were so incredible that most people doubted Dragon's Lair would ever make it to the home computer. Software Projects, however, has



accepted the challenge and produced a version of Dragon's Lair, first for the Commodore 64 and shortly for the Amstrad and Spectrum.

Set in the past, where knights were knights and everyone loved them for it, you take control of Dirk the Daring, King Aethelred's most daring and accomplished knight. It is Dirk's task to rescue Princess Daphne, the king's only child who has been abducted by the Singe, an mean and evil dragon.

Dragon's Lair is an amazing piece of technical software. Software Projects has managed to create an amazingly good replica of the arcade game, even down to the detailed graphics and large characters.

To get all of the game on to cassette, a new and innovative loading system has been used which allows the loading of the next section of the game while the previous section is being played. In practice, that system is excellent and



permits a great dea more game to be included without having to wait for laborious multi-part loading.

Each level involves defeating various evil beings, varying from Air-Genies to Spectres and, in the final screen, Singe. Dragon's Lair is without doubt the best game Software Projects has released since *Jet Set Willy.* It combines spectacular use of the Commodore graphics with fun and imaginative music. In many ways Dragon's Lair is the best arcade conversion yet.

IRIDIS ALPHA

► *C64 ● Hewson/Llamasoft ● Shoot-'em-up ● Francis Jago ● £8.95*

Only recently have pure shoot-'em-ups become less than trendy. There was a time when a game that consisted of nothing except unadulterated blasting would have been an instant hit. Now, for

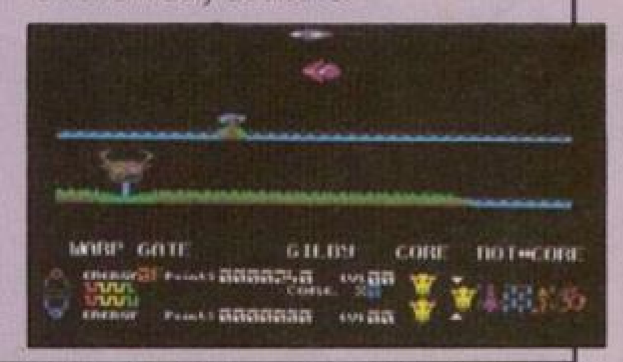


a game to be successful it must either be an arcade conversion, or have three-dimensional graphics and a Rob Hubbard sound-track.

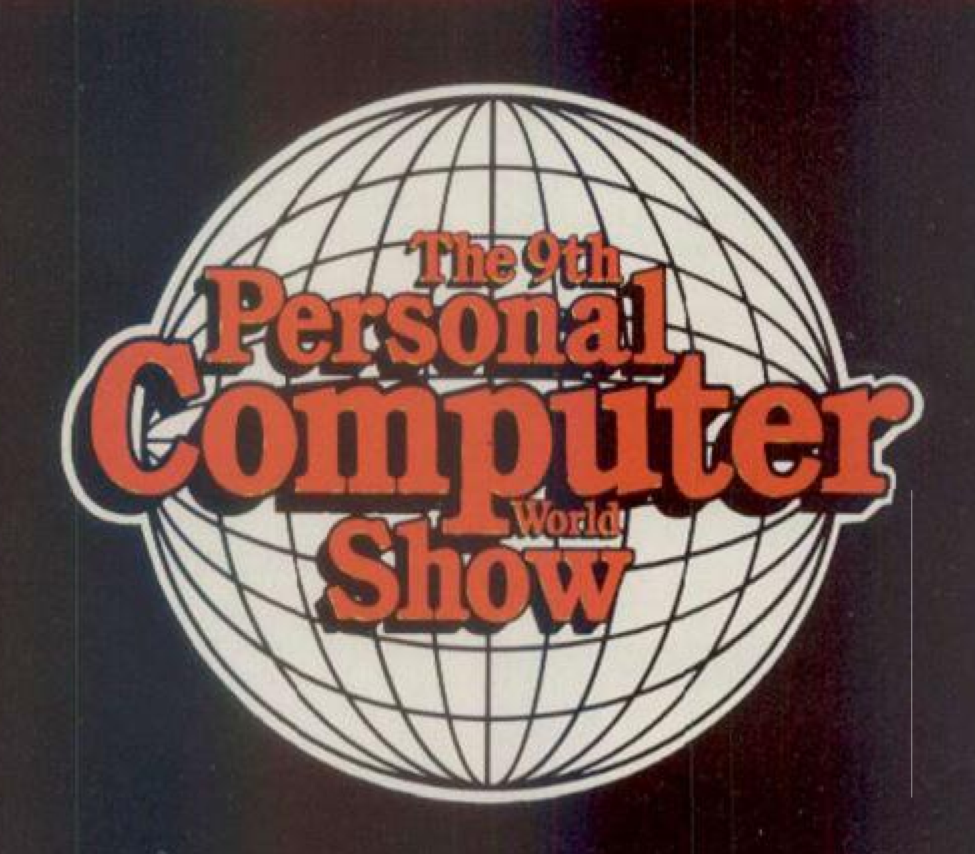
If one person can go a long way towards changing all this it must be Jeff Minter, the enigmatic programmer behind Llamasoft. Although his last release, Battalyx, was not the hit it deserved to be, Iridis Alpha, his first game for the Llamasoft/Hewson label, should reinstate him as the master blaster.

Both the graphics and the sound suit Iridis perfectly, and the scrolling has to be seen to be believed – although master Minter promises it can go much faster!

Games fans who have been starved of a good blast since Uridium will breathe a sigh of relief when they see Iridis Alpha. It is Jeff Minter at his all-time best, great fun and madly addictive!

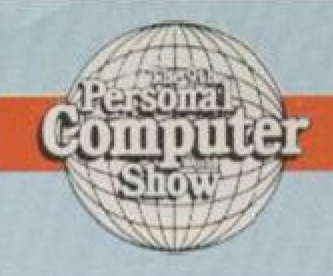


Your COMPUTER



3-7 SEPTEMBER 1986
OLYMPIA LONDON

PREVIEW



The Personal Computer World Show is undoubtedly the biggest event in the computing calendar. The 1985 Show played host to more than 72,000 visitors from all over the country and many from overseas. At least as many are expected this year, making the Show an event not to be missed. We spoke to some of the companies due to exhibit to discover their plans.

Activision

Will be unveiling a new strategy game, *Hacker 2 – The Doomsday Papers*, which will be released in multiple format for all the popular home micros. *Moonmist* will also be previewed at the show. This tongue-in-cheek spoof of early-30s sci-fi comics involves a leather goddess who attempts to convert the earth into her pleasure planet.

Acorn

The Acorn flagship, the BBC Master Series, will be on display, as will the recently-released Acorn M19. This MS-DOS PC clone is aimed at the educational market in response to requests for such a machine but Acorn is sure many business buyers will also be interested. Plenty of new games and software packages will be released with a view to catching the Christmas market.

Addictive Games

Will display its new range of products, including *Arak* for the Commodore 64, *Kirel* for the Spectrum and *Head Coach*, a strategy game based on American football. The Show will also be used as a launch vehicle for *President*, the latest strategy game by Kevin Toms, author of *Football Manager*.

Advance Memory Systems

Exhibiting the AMX mouse and art package for Amstrad, Spectrum and BBC computers. A new mouse and software package is also planned for the Amstrad PCW8256. For the Atari 520ST, *Finesse*, a desk-top management package, is due to be launched and Advance hopes to release a conversion for the Commodore 64 in the near future.

Alligata

The long-awaited *Pub Games* will be on display at the show. This combination of darts, bar billiards, poker and other games in expected to be a major hit. *Sirus 2* will be shown for the Spectrum and the new arcade game *Kettle* will be previewed for Amstrad and Commodore machines. Alligata also plans a fast-action arcade game for the Amstrad PCW8256.



Amstrad

Rumours of the long-awaited Amstrad PC clone, for the moment, remain rumours. Amstrad is unwilling to give an advance date for when the machine will be ready but, considering the large number of other low-cost compatibles which will be launched at about the same time, it seems likely that the Amstrad machine will appear at the show, if not slightly earlier. One certainty is that the equally long-awaited Sinclair-Amstrad machine will be at the show. It will have 128K of memory and be based on a Spectrum but with a built-in data recorder. The retail price is to be £149. A full range of products for CPC and PCW machines will also be featured.

American Research Corporation

This company, well-known for its ARC Turbo PC-compatible in the business world, has produced a portable version of this successful machine and reduced the price to a more affordable £475. It features five expansion ports, 256K of memory as standard and a single 360K floppy disc drive. The new machine is expected to have a very wide appeal and is being called The World PC.

Atari

Will surely have one of the most spectacular stands of the Show. More than 1,000 sq. ft. has been allocated to what will be known as the Atari Village. More than 70 software companies will have stands in the village and will be demonstrating all the latest products, games and utilities for the Atari range of computers. Although all machines in the Atari range will be covered, there is expected to be heavy emphasis on new products for the ST. The purpose of the project is to show Atari computers in action, whether in education, industry or entertainment.



Beyond Software

Attention all *Star Trek* fans. To coincide with the one of the world's most popular television serials, Beyond Software is releasing the computer game version of the series for Atari, Commodore, Spectrum and Amstrad computers. *Dark Scepte*, *Dante's Inferno* and *Infodroid* will all be released on the C64 with conversions to Amstrad and Spectrum machines to follow.

Boot Out

Remainder – that is out-of-date software – will form a large portion of the products on the stand. The prices will be very low and there are expected to be some books and hardware as well, also at greatly-reduced prices. Boot Out will also be offering a laser-printing service and demonstrating its new desk-top publishing kit.

Britannia Software Ltd

Dempsey and Makepeace, a new arcade adventure game, will be released for the Amstrad computer with a Spectrum conversion to follow. Following the success of the Romplus cartridge, a new version with 15 sockets will be launched. A cartridge-based spreadsheet for Amstrad machines is hoped to be completed in time for the show.

Bubblebus

Will be launching its latest games software. The new titles include *Ice Temple* for the Spectrum, *Moonlight Madness*



also for the Spectrum, and a conversion of *Star Quake* for Atari and MSX machines. Two shoot-'em-up games for the C16, *Trizons* and *Tazz* will also be on display. A demonstration of *Supernes*, the successful database for newsagents, is also planned.

CDS

Following the huge and unexpected success of *Colossus 4 Chess*, CDS will be launching *Colossus 4 Bridge*, initially on Amstrad and Spectrum machines with further conversions to follow. The game is being marketed as a complete bridge package with the successful book, *Begin Bridge*, being included in the price. Many new titles, under the budget label Blue Riband, are also planned for the show.



Cheetah Marketing

As well as the Specdrum and Amdrum kits which will be on display, Mach One, a new microswitch joystick will be seen for the first time. It features four fire buttons, a metal shaft and an auto-fire selector as standard. In addition, new sound samplers, musical keyboards and Midi interfaces will be launched for Amstrad and Spectrum computers.

Connexions

Connexions manufactures cables and interfaces for a wide range of computers but concentrates mainly on the IBM PC and its clones. It claims to be able to connect any peripheral to any computer. A full range of products, plus a few new additions to the range, will be on display.

Columbia Computer Products

This company is responsible for the U.K. sales and marketing of Columbia, the largest independent British ribbon manufacturing company. At the show it will display disc kit boxes, screen filters and computer cleaning kits. A new monitor stand, aimed at the home and business user, able to turn 360 degrees and tilt up to 12.5 degrees will be launched.

The full range of ribbons will also be display, many at specially-reduced Show prices.

Commtel

Will demonstrate its range of internal and external modems for the Amstrad PCW range. A modem package for IBM compatibles is also expected to be on display. Wordstream, a Bournemouth-based typesetter, may also be on the stand. Its customers use a system of code-embedded ASCII files which are then sent to Wordstream either via a modem or on disc, to produce finished typesetting at a very low cost and in a short time. Commtel is also hoping to release a low-cost diasywheel printer.

Computers Unlimited

Specialises in Apple Macintosh computers. The stand will feature a complete kit for desk-top publishing which includes the Apple Laserwriter. New products due to be launched include a 2MB upgrade kit for the Macintosh +. The company is also hoping to launch new products now on display at the Boston Apple Show in the States.

Computer Bookshops

Books and manuals for all the best-known business machines will be on display. *Top View*, *WordStar*, *dBase 3*, *Desk-Top Publishing* and *Lotus 1-2-3* are a few of the subjects to be covered. There will also be a shelf containing damaged and shop-soiled books for those with an eye for a bargain.

Computer Manuals

This subsidiary of Computer Bookshops will be displaying a range of manuals and books for the complete range of Amstrad PCW and CPC, Sinclair Spectrums and QLs, Commodore and BBC machines. Instruction for languages from Basic to Pascal and operating systems from Appledos through C/PM to Xenix will also be available.

CRL

Cyborg, an arcade adventure, will be previewed on the Commodore 64 machine at the Show. Twenty monitors will show various stages of the game which is due to be released shortly after the Show. The plot revolves round a group of scientists who attempt to save earth from total destruction by an asteroid which is on a collision course. When contact with the boffins is lost, Cyborg is sent to find and rescue them. There are, however, many obstacles and dangers which he must overcome before he can succeed. Conversions for Amstrad and Spectrum machines are hoped to follow closely the release of the Commodore version of the game.

CRL Group Ltd

Produces a wide range of dust covers for most makes of printer and computer. At the show its latest product will be on display, a new range of padded carrying cases designed to make your non-portable micro portable.

Cumana

A new range of disc drives for BBC and Atari computers will be some of the items on display at the Cumana stand. An upgrade kit for the BBC model B providing 0.5MB of RAM and additional graphics will also be shown. Interfaces and peripherals capable of reading the Astron card, a credit card-sized ROM, will be launched for BBC, Amstrad and IBM machines.

Domark

The Amstrad version of the recently-renamed *Split Personalities* will be available. The much-talked-about *Trivial Pursuits* will be released for Commodore, Spectrum, Amstrad and BBC machines. A Commodore conversion of a more recent release, *Gladiator*, will make its first public appearance and a sequel to *Eureka* will be released for Amstrad, Commodore and Spectrum computers.

Direct Disc Supplies Ltd

Now in its third year of trading, Direct Disc is hoping to make a big impact at the show. As the name implies, the company specialises in discs, mainly 5.25in. and 3.25in. floppies, offering a lifetime warranty and duplication with copy protection if required. In addition, a range of magnetic media products will be available.

Direct Technology

Will be unveiling the world's first software robot. This PC-

compatible program can be used to teach users how to operate a program. It can detect errors and is therefore expected to be very popular in the educational and computer-based training markets. Examples of programs running with the robot will be on display. A surprise announcement will also be made.

Duckworth Publishing

A large range of books and software for a number of computers will be available. The show is to be used as a launch vehicle for a new book, *Further Adventures on the 64*, a guide to advanced programming for Commodore 64 owners written by Peter Gerrard and costing £6.95.

Durell Software

Many new releases are planned but only two are expected to be ready in time for the show. The first is *Thanatos*, an arcade adventure written by Mike Richardson, author of the best-selling *Turbo Esprit*. It involves taking control of a dragon whose eternal destiny lies in conflict with Eros the life-giver. Thanatos will be previewed on the Spectrum. The second of the two releases is called *Chain Reaction*. This arcade game involves saving a sabotaged nuclear power station from destruction. It will be previewed on the Commodore 64.

Elite Systems

Will be exhibiting up to six new products including *Scooby Doo* for Amstrad and Spectrum computers. A new budget range of £2.99 classics will also be released and many game conversions are expected.

Encyclopedia Britannica

The latest edition of *Britannica* was published last year and will dominate the stand. Having increased the number of volumes from 30 to 32 and having introduced a data annuual which can be bought each year to keep the volumes up-to-date, the company is hoping this edition will last well into the 21st century. Encyclopedia Britannica is hoping that many people will take the opportunity to visit the stand and discover more about the books and the way in which they are made. In addition to Britannica, many other books will be on display.

First Publishing

This Pangbourne-based distributor of software and books for home and business micro markets is launching a new magazine at the show. As yet untitled, many pages will be in full colour with others in two colours. It will cover software and books only, with an editorial mix of news, reviews of new products and in-depth feature articles.

Gemini Marketing

Is launching a new newspaper. Aimed at the end-user, it will be distributed via a national network of advisory centres. It will cost 50 pence and most of the stories will have a definite Gemini bias, with 40 percent of the magazine dedicated to Gemini computer news.

Glentop Publishers

Much of the stand will be dedicated to books on word processing with the Amstrad 8256 and 8512 machines. A new series of books for the Atari ST covering a wide range of topics from using databases to business applications. One 500-page book, *Advanced users' guide to the Atari ST*, has a foreword by Jack Tramiel, president of Atari Corporation. A full range of books for Commodore, Spectrum and BBC machines will be on display.

Gremlin Graphics

Using the show to launch several new games. They include *Trailblazer* and *Avenger*, a follow-up to the successful *Way of the Tiger*. *Future Knight*, one of the new trend of blast-ventures, will also be previewed, as will *Footballer of the Year*, a strategic football simulation.

Haba

Will have two stands. The first, in the Atari area, will show a new word processor which works in a windowing environment. The other will display a new desk-top publishing kit. A range of business programs such as *Mailmerge* and *Spellcheckers* will also be shown, as will a video digitiser and flight simulator for the ST.

Hewson

Iridium, the popular C64 game, will be released on the 48K Spectrum. *Alleykat*, a shoot-'em-up arcade adventure and *City Slicker* will be also be released, on Spectrum and Amstrad CPC machines. Another new title, *Firelord*, will be shown for the Commodore, Amstrad and Spectrum.

Interceptor

The stand will be split into several sections, of which only a small part will be occupied by Interceptor products. A good deal of the space will be devoted to a new budget software label which is being launched. The other main release is a text adventure which includes sequences of animated graphics. Based on the aftermath of an earthquake, the game is called *Aftershock*.



Kempston

Plans to concentrate more on the IBM and small business market and much of the stand will be devoted to promoting the new IBM mouse and interface package. A full range of products for home computers will also be shown. It will include many joysticks, interfaces and mice for Amstrad and Spectrum computers. Owners of the Amstrad PCW machine should be interested in a new joystick and interface package for the 8256 and 8512 machines which is to be launched at a price of £29.95.

Level 9

Will celebrate its fifth anniversary by displaying many of its earlier products. The stand will be based on a small museum, tracing the history of the company from early days to its present status. A Nascom, one of the first home computers, will be run next to an Amiga to show the advances in computer technology which have been made in recent years. Preview videos of new, as yet incomplete games, will be running.

Lightning Distribution

The complete product range will be on display. It will include Amstrad PCW machines, 128K Spectrums and Star printers. Demonstrations of the Casio range of musical keyboards are planned and the company hopes to launch one or two new products.

Linear Graphics Ltd

A low-cost professional graphics plotter, launched originally at the Acorn User Show, will be on display. Aimed at educational and industrial markets, the A3M is fully-compatible with the BBC microcomputer using the same set of graphics commands to move the plotting pen. An A4 desk-top version will also be shown.





Mastertronics

The main show launch for this successful budget software house will be *Flash Gordon*, the game version of the '50s science fiction serial. Because of the complexity of the program, it will be available initially only in a multiple-load format for the Commodore 64. Conversions to other machines are expected to follow in the near future. Many new products for Atari ST machines, brought recently from the U.S., will be shown.

MacMillan Publishers

A new software title, *Piranha*, will be seen for the first time. Five new games are also planned, one a licence from a forthcoming television program. The others are *Rouge Trooper*, a game based on the comic hero; *Nosseratu the Vampyre*; *Strike Force Cobra*, a graphic adventure incorporating digitised photographs of the games programmers; and *The Colour of Magic*, a new text adventure.

Micronet 800

A new telesoftware package, launched in August, will be publicised at the show. Micronet will also be promoting its offer of a free modem for all BBC and Spectrum owners on becoming a subscriber to the computer-orientated database.

Micro Media

Manufactures a large number of products for many home and business computers. A wide range of products from discs and ribbons to printer and monitor stands will be on display. There are expected to be some new additions to the range launched at the Show.

Micro Processor Engineering

Workworth, a new Forth programming utility, will be released for Amstrad, Atari, and PC-compatible computers. The Amstrad version costs £35 and runs on computers in the CPC range and incorporates a full editor and the ability to run compilers.

Modem House

A new as yet unmaned modem will be unveiled. It will feature auto-answer and auto-dial as standard and be fully software-controlled. A multi-speed facility allows it to support a number of baud rates, including V21, 22 and 23. Although no specific details of the machine are available, it will be Hayes-compatible and in direct competition with the Quattro but costing less than £300.

Neutral Ltd

A point-of-sale terminal will be launched. Aimed at large retail companies, it will allow a customer's bank account be debited instantly at the time of buying goods. That would greatly reduce the amount of paperwork involved in such a transaction and also decrease the time spent waiting to pay for goods.

Newstar

Will be concentrating on PC-compatible products. A new range of software should be launched. It will include *Newfile*, the first database to operate under a memory-resident system which simulates a multitasking environment. *Cracker*, a high-resolution graphics spreadsheet, also memory-resident, will also be on display.

Opus

Set to launch a four-model range of PC Turbo compatibles with a starting price of £499. The machines feature the ability to expand the internal memory up to 1MB, thus creating a RAM disc. They are built to full U.K. specifications with pound signs on the keyboard. The range, called the PC2, is expected to sell well in business, educational and the home market.



Palace Software

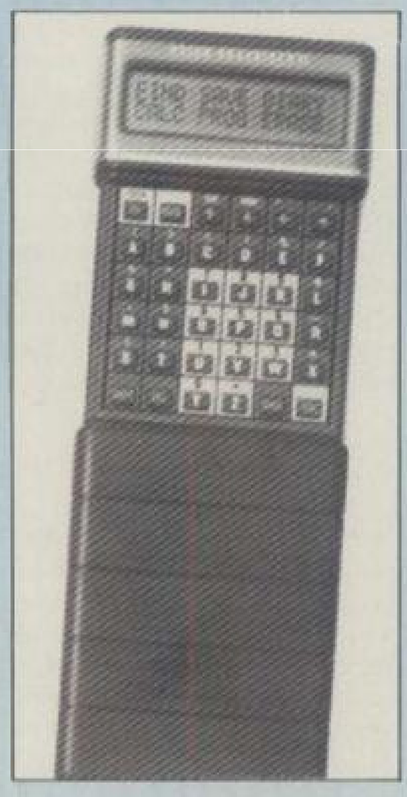
Hoping to follow the success of its two recent hit games, *Cauldron* and *Cauldron II*, Palace Software will be releasing a new visual arcade adventure, *The Sacred Armour of Antirad*. It will be launched initially on Commodore and Spectrum machines with a conversion for the Amstrad CPC range to follow later in the year.

Phillips Electronics

The popular range of medium-resolution colour and monochrome monitors, compatible with most makes of home and business computers, will be demonstrated and a new high-resolution colour model is due to be launched.

Prospero

The simultaneous U.K. and Japanese launch of Pro Fortran 77, a much-demanded and long-awaited compiler for the IBM PC will be released. Versions for the Sinclair QL and the Atari ST will also be on display and many other packages, including the Pro Pascal compiler, will also be shown.



Psion

A new chess program for the IBM PC and its clones will be on display. The best-selling pocket peripheral, the Organiser II, will also be on show, along with the range of expansion and utility packages which exist for it. Other new business software for PC compatibles will be demonstrated.

Rainbird Software

Part of the British Telecom information technology group, Rainbird forms the leading edge of BT software development. Many of its products are produced for Atari and Amiga machines and many are later converted to smaller machines. *Starglider* will be released for the ST and conversions to the C64, Spectrum and Amstrad will follow later in the year. *The Pawn*, the much-acclaimed text and graphics adventure, released originally on the ST, has now been converted to the C64 and is expected to be very popular. Finally, *Tracker*, a war-gaming simulation, will be previewed. Rainbird hopes that it will have a more wide-ranging appeal than most other war games.



Research Machines

A multi-user, multi-tasking, desk-top publishing kit using a window operating environment will be demonstrated on the Nimbus machine. Two new laser printers, one capable of producing litho-like quality, will be shown. An interactive video system for the Nimbus which allows the mixing of video images and computer-generated graphics on-screen will be making an appearance.

Robtek

Will be continuing its budget range of business software for the C16. It includes a database, word processor and spreadsheet which will all cost £4.95 and the programs will be available shortly on other machines. *Filemaster*, a database using a windowing environment similar to the ST, will be making an appearance and two programs for the Atari, one a utilities toolkit and the other a time clock, will be released, each at £29.95.

Romantic Robot

Multiface II for the Amstrad CPC range will be launched officially at the Show. Several new games are also due to be on display, the major release being *Never Mind The Nasties*, a combination of a maze, platform and arcade adventure.

Spectravideo

The public launch of the Quickshot Turbo joystick will be a major event. The new model uses the same styling as its popular predecessor, the Quickshot 2, but uses directional microswitches to give improved control.

Spectrum

Will be featuring a new range of imported Bondwell PC compatibles. Prices begin at £599 for a 256K single-disc-drive model and rise to £999 for a 20MB hard disc model. In addition, a full range of products for most popular home computers will be on display.

Tasman

New products will include a spelling checker program for the Amstrad PCW machines. Many others are planned but, as yet, the company is unsure which will be ready in time for the show.

Times Computer Services Ltd

This rapidly-expanding company deals with the recruitment of computer personnel, full-time and part-time, on a contractual basis. The company will be showing other companies the type of service it can offer.



Transform

One of the few stands where you will be able to buy Microdrive cartridges. In addition to this sometimes rare commodity, storage boxes for Microdrives and 3in. discs will be shown. A new integrated accounts package for the QL is due to be unveiled.

Tynesoft

A package of four games on one disc for PCW machine will be one of the main attractions. Featuring classic games such as *Pac Man* and *Space Invaders*, it will be offered at an extremely low price. A conversion of *Winter Olympics* to MSX machines and of *Who Dares Wins* for the C16 will be featured and *Jet Set Willy* for the Atari ST will be on display. A new multi-screen arcade adventure for the Amstrad will be previewed.

Videk

Videk manufactures a wide range of cables, connections and piece parts such as DIN plugs and sockets. It produces those items to fit almost all home and business computers and the stand will have a selection of the products on display.

W H S Distribution

Books and manuals from Osborne and Kingfisher, covering a range of topics on most popular home computers, will be on display. Two new games from Mosaic Software will also be displayed. The first, *The Growing Pains of Adrian Mole*, is a follow-up to the successful computer game version of *The Secret Diary of Adrian Mole*, released last year. The second, *The Archers*, is based on the long-running radio series.





ADDRESS BOOK

Activision U.K. Ltd
31 Carlton Crescent
Southampton
Hampshire
SO1 2EW
01-431 1101

Acorn Computers Ltd
Fulborn Road
Cherry Hinton
Cambridge
CB1 4JN
0223 245200

Addictive Games Ltd
Albert House
10 Albert Road
Bournemouth
Dorset
0202 296404

Advance Memory Systems
166-170 Wilderspool Causeway
Warrington
WA4 6QA
0925 413504

Alligata Software Ltd
1 Orange Street
Sheffield
South Yorks
S1 4DW
0742 755796

American Research Corporation
160b Handcroft Road
Croydon
Surrey
CR0 3LE
01-684 4144

Amstrad
Brentwood House
169 Kings Road
Brentwood
Essex
CM14 4EF
0277 228888

Atari Corporation (U.K.) Ltd
Atari House
Railway Terrace
Slough
Berkshire
SL2 5BZ
0753 33344

Beyond Software
Wellington House
Upper St Martins Lane
London WC2
01-240 9350

Boot Out
PO Box 147
Putney
London
SW15 1AU
01-788 1454

Britannia Software
Units 25-27
Cardiff Workshops
Lewis Road
Cardiff
0222 481135

Bubblebus
87 High Street
Tonbridge
Kent
TN9 1RX
0732 355962



Cheetah Marketing Ltd
1 Willowbrook Science Park
Crickhowell Road
St Mellons
Cardiff
CF3 0LF
0222 777337

CJE Microcomputers
78 Brighton Road
Worthing
West Sussex
BN11 2EN
0903 213900

Columbia Computers
Unit 5, Croydon Road Ind. Est.
Tannery Close
Beckenham
Kent
01-656 8233

Computers Unlimited
246 Regents Park Road
London N3 3HP
01-349 2395

Computer Bookshops
30 Lincoln Road
Olton
Birmingham
B27 6PA
021 707 7544

Computer Concepts
Gaddesden Place
Hemel Hempstead
Herts
HP2 6EX
0442 63933

Connexions
125 East Barnet Road
New Barnet
Herts
EN4 8RF
01-441 1282

CRL Group plc
9 Kings Yard
Carpenters Road
London
E15 2HD
01-533 2918

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The Pines Trad. Est.
Broad Street
Guildford
Surrey
GU3 3BH
0483 503121

Direct Technology
Grove House
551 London Road
Isleworth
Middlesex
TW7 4DS
01-847 1666

Domark Ltd
204 Worple Road
London
SW14 8PN
01-947 5622

Durell Software Ltd
Castle Lodge
Castle Green
Taunton
Somerset
TA1 4AB
0823 54489

Easi-Bind International
Adams Close
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Derbyshire
DE7 7GX
0773 761341

Elite Systems
Anchor House, Anchor Road
Aldridge
Walsall
West Midlands
WS9 8PW
0922 55852

Encyclopaedia Britannica
Mappin House
4 Winsley Street
London
W1N 8EB
01-637 3371

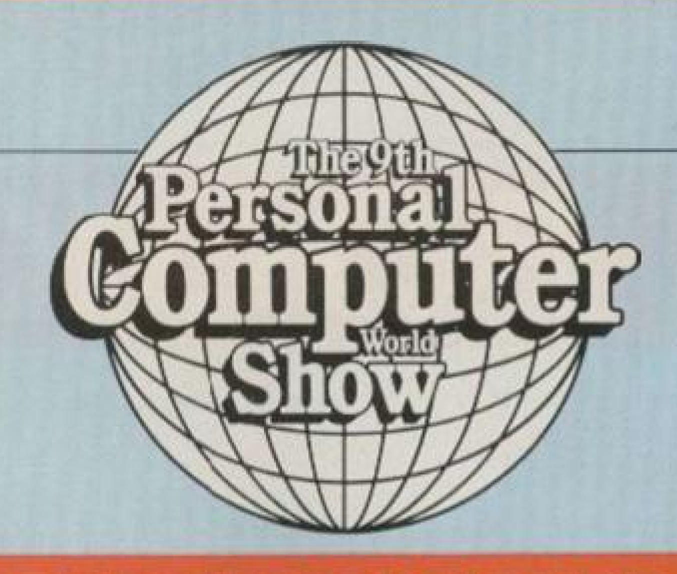
Firebird Software
Wellington House
6-9 Upper St Martins Lane
London
WC2 9DL
01-379 6755

First Publishing Ltd
Unit 20B Horseshoe Park
Horseshoe Road
Pangbourne
Berkshire
RG8 7SW
5244 07357

Glentop Publishers
Standfast House
Bath Road
High Street
Barnet
Herts
01-441 4130

Gremlin Graphics Ltd
Alpha House
10 Carver Street
Sheffield
S1 4FS
0742 753423

Haba Systems Ltd
Pier Road
North Feltham Ind. Estate
Feltham
TW14 0TT
01-751 6451



ADDRESS BOOK CONT'D

Interceptor Group
Murcury House
Calleva Industrial Park
Aldermaston
Berkshire
07356 71145

Kempston
Unit 4
Manton Lane
Beds
MK41 7HY
0234 327544

Level 9 Computing
229 Hugheraden Road
High Wycombe
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HP13 5PE
0494 26871

Lightning Distribution Ltd
841 Harrow Road
London
NW10 5NH
01-969 5255

Lightwave Leisure Ltd
Unit 31
Wirral Business Centre
Gorsey Lane
Birkenhead
L41 1JW

Linear Graphics Ltd
28 Purdeys Way
Rochford
Essex
SS4 1NE
0702 541664

Llamasoft
49 Mount Pleasant
Tadley
Hampshire
RG26 6BN
07356 4478

Mastertronic
8-10 Paul Street
London
EC2
01-693 8354

Melbourne House
Castle Yard House
Castle Yard
Richmond
TW10 6TF
01-940 6064

Micronet 800
Durrant House
8 Herbal Hill
London
EC1
01-278 3143

Mikro-Gen
Unit 15
The Western Centre
Western Road
Bracknell
Berkshire
0344 427317

Mirrorsoft
Maxell House
Worship Street
London
EC2A 2EN
01-377 4785

Modem House
70 Longbrook Street
Exeter
Devon
EX4 6AP
0392 213355

Neutral Ltd
Cecil House
2 Tabernacle Avenue
Plaistow
London
E13 8ED
01-474 6010

Newstar Software
200 North Service Road
Brentwood
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CM14 4ST
0277 229509

Ocean Software Ltd
Ocean House
6 Central Street
Manchester
M2 5NS
061 832 6633

Olympic Systems Ltd
42 Boston Road
Beaumont Leys
Leicester
LE4 1AA
0533 358839

Opus
55 Ormside Way
Holmethorpe Ind. Est.
Redhill
Surrey
0737 65080

Orpheus Ltd
Unit 1 Church Farm
Hatley St. George
Sandy
Beds
0767 51481

Palace Software
275 Pentonville Road
London
N1
01-278 0751

Pitman Publishing Ltd
128 Long Acre
London
WC2 9AN
01-379 7383

Precision Software Ltd
6 Park Terrace
Worcester Park
Surrey
KT4 7JZ
01-330 7166

Psion Ltd
Psion House
18-19 Harcourt Street
London
W1H 1DT
01-723 9408

Rainbird Software
Wellington House
Upper St Martins Lane
London
WC2H 9DL
01-240 8838

Research Machines
Mill Street
Oxford
OX2 0BW
0865 249866

Robtek
Unit 4
Isleworth Business Complex
St Johns Road
Isleworth Middlesex
01-847 4457

Romantic Robot
77 Dyne Road
London
NW6 7DR
01-625 9463

Satellite Computing
236 Sandycombe Road
Richmond
Surrey
TW9 2EQ
01-940 1810

Softek International
12-13 Henrietta Street
Covent Garden
London
Wc2E 8LH
01-240 1422

Software Int. Distribution
Unit 10/11
Imperial Studios
Imperial Road
London SW6
01-731 4555

Spectravideo
165 Garth Road
Morden
Surrey
SM4 4LH
01-330 0101

Spectrum Group plc
5 Hunting Gate
Hitchin
Herts
SG4 0TJ
0462 37171

Tasman Software Ltd
Springfield House
Hyde Terrace
Leeds
LS2 9LN
0532 438301

Times Computer Services Ltd
95 York Street
London
W1
01-258 1878

Transform Ltd
24 West Oak
Beckenham
Kent
01-658 6350

Tynesoft
Addison Ind. Est.
Blaydon
Tyne & Wear
NE21 4TE
091-414 4611

Videk Ltd
26 Queensbury Station Pde
Edgware
Middlesex
HA8 2QA
01-951 1183

W H S Distribution
St Johns House
East Street
Leicester
LE1 6NE
0533 551196

DROID ONE

► *C16/Plus 4 ● Bug Byte ● Arcade ● Ian Nicol ● £?.??*

Droid One is a robct sent to rescue humans who have become stranded on the planet Vragus IV while mining for the elusive Di-planium ore.

Thirty-two zones of increasing difficulty lay between you and the completion of the rescue mission. Thirteen varieties of alien, from homers and speedies to pods and deadly shrapnel, teleport on to the screen in ever-increasing numbers.

As it stands the mission is difficult but if you feel like more of a challenge there is a suicide mode in which you have to last one minute in each zone to gain a bonus score – not so easy as it sounds.

OVERALL ● ● ● ●



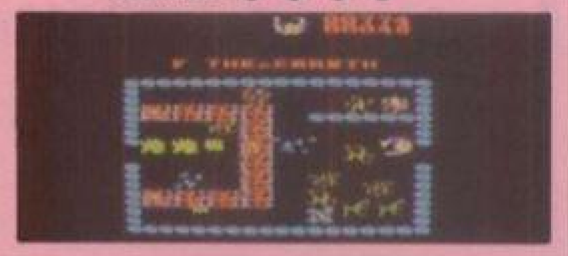
STORM

► *Amstrad ● Mastertronic ● Arcade Adventure ● Francis Jago ● £1.99*

Without doubt, *Storm* is a budget version of the best arcade machine of the last few months, *Gauntlet*. It is a one- or two-player game in which the idea is to travel round a maze until you can find and rescue Corrine, Storm's wife.

Excellent graphically, Storm is an ideal two-player game. Using teamwork, Storm and his aide Agravain Undead can blast theiur way past almost any obstacle. As with Gauntlet, there are food, armour, scrolls and masks to collect; some are good and some are not. As budget Amstrad games go, this is a classic.

OVERALL ● ● ● ●



REBELSTAR

► *Spectrum 48K ● Firebird ● Strategy ● Ian Nicol ● £1.99*

In *Rebelstar*, the game takes place at a control base on the moon. In the one-player game you take control of a group of desperate raiders as they attack Moonbase Delta. Once inside, you must locate and then destroy the ISSAC computer which controls the base.

The two-player game is similar but the second player takes command of the operatives of the base. In addition to defending against the raiders, he must also activate additional droids and arm his human operatives with rifles from the armoury. As the game progresses, reinforcements arrive for both sides and the battle continues.

OVERALL ● ● ● ● ●



ROBO KNIGHT

► *C16 ● Americana ● Arcade Adventure ● Francis Jago ● £2.99*

With more and more companies releasing high-quality software for the C16, releases such as *Robo Knight* can be looked at in a completely different way. Compared to Commodore 64 games, it is nothing very special; in its own right, however, it is a tremendous fun arcade/adventure.

Graphically it is a cross between a Jeff Minter game, with excellent use of colour, and *Jet Set Willy*. It has all the usua obstacles – sliding doors, bridges and jumps, and is very well-presented.

Overall, Robo Knight is very good value and will provide hours of fun for users of any age.

OVERALL ● ● ● ●



FREAK FACTORY

► *C64 ● Firebird ● Arcade Adventure ● Francis Jago ● £1.99*

Riding high on the mammoth success of *Thrust*, Firebird has released its latest batch of budget games for the Commodore 64. The first is *Freak Factory*. As with many of the recently-released arcade/adventures for the Commodore 64, the main Freak Factory character is a somersaulting man whose sole desire in life is to rid the world of an evil professor.

Using a sideways "flick" screen, rather than scrolling, there is a wide variety of baddies to dodge and holes to leap over. As a budget game Freak Factory is not bad, but neither is it good enough to deserve recommendation.

OVERALL ● ●



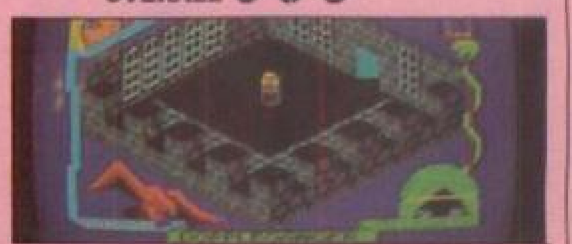
DOPPLEGANGER

► *Amstrad ● Americana ● Arcade Adventure ● Francis Jago ● £2.99*

Alligata Software has a good name for producing software but many of its titles fail to have lasting impact. What has that to do with *Doppleganger?* Well, Americana bought Doppleganger and has released it at a budget price in an attempt to sell more copies.

As arcade adventures go, Doppleganger is reasonably good. It has very pretty graphics for an inexpensive game and would provide many hours of fun for the dedicated Ultimate fan. A Doppleganger is, supposedly, a double. Everyone has a Doppleganger somewhere. In this game, you control both you and your double. Novel and fun.

OVERALL ● ● ●

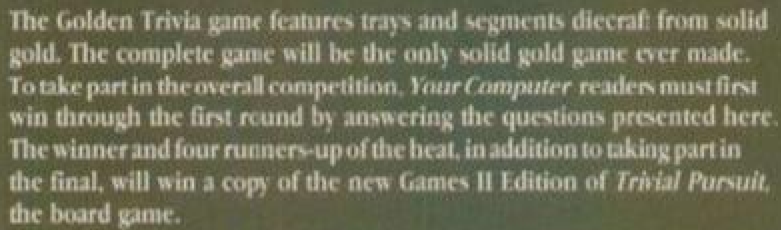


Take part in the Domark

Golden Trivia Challenge

Win a Trivial Pursuit board game with **solid gold** *playing pieces worth an estimated*

£10,000



The Golden Trivia game features trays and segments diecraft from solid gold. The complete game will be the only solid gold game ever made. To take part in the overall competition, *Your Computer* readers must first win through the first round by answering the questions presented here. The winner and four runners-up of the heat, in addition to taking part in the final, will win a copy of the new Games II Edition of *Trivial Pursuit*, the board game.

Another 10 runners-up will receive a pack of Trivial Pursuit After Dinner Chocolate Mints.

HOW TO ENTER

Study the questions and answer as many as possible. For each correct answer entrants will be awarded 10 points. The person with the most points will be adjudged the winner of the *Your Computer* heat of the competition. The runners-up prizes will be awarded to the entries with the second, third and so on highest points. At any stage, in the event of a tiebreak, the humour and originality of the tiebreak question will determine the winning entry.

Closing date September 30, 1986.

Computing

In his youth, Sir Clive Sinclair was a technical journalist on a monthly magazine. What was the title of the magazine?

____

Which early microcomputer model number could have formed part of a post code for an Open University town?

____

Your Computer *featured in a TV advertisement for which well-known tinned food product?*

____

Which company experienced jumbo-sized problems with the Advertising Standard Authority with its Christmas 1984 TV advertising campaign?

____

Science Fiction

What type of TV mission did Mr. Spock accept after he finished duty aboard the Enterprise?

____

Which famous sci-fi film earned the irreverant alternative title Ten past Eight?

____

For what do the initials of Dr Who's time travel machine the Tardis stand?

____

Which famous fictional computer was one step ahead of Big Blue?

____

General Knowledge

At what temperature do the Celsius and Fahrenheit scales coincide?

____

Who was the last English tennis player to win a Wimbledon title?

____

Who stayed in orbit when the Eagle landed?

____

What was the title of the first book to be published in England?

____

Films

Which saintly actor was persuaded to join the Civil Service?

____

Which dirty cop shares a surname with a former Prime Minister?

____

Which motorcycling star attempted to jump to freedom in The Great Escape?

____

What was the name of the town in which Gary Cooper did his duty at high noon?

____

In addition, we would like you to invent your own Trivial Pursuit question which may, at a future date, be used in a data tape for Trivial Pursuit, the computer game.

My trivial question is _______________

____

____

Answer _______________

Name _______________

Address _______________

____

____

Postcode _______________

Daytime telephone number _______________



The Pawn is coming to the 64. Isaac Asimov games to be released soon. News in Roger Garrett's monthly offering.

Adventure corner

The Pawn is coming. That is the news for which most adventurers have been waiting. Magnetic Scrolls, along with Rainbird, is finally set to release the most widely-publicised and eagerly-awaited adventure game since *Lord of the Rings*. Those who own an Atari ST or Sinclair QL will no doubt already have enjoyed the delightful land of Kerovnia. Now CBM64, Amstrad and Amiga owners can look forward to exploring this land as well.

I expected the CBM64 version to be text-only, as is the QL game, but at a recent demonstration I was surprised to see that the amazing ST graphics have been reproduced faithfully for the machine. There are no pull-down windows as in the ST version but the graphics are some of the best I have seen on the 64. A full CBM64 review, complete with hints, will appear in this column as soon as I receive a copy.

Also ready to appear soon is the re-vamped Level 9 trilogy. Released by Rainbird and re-titled *Jewels Of Darkness*, it is a must for every adventurer, even if you have played them under the old titles of *Colossal Adventure*, *Adventure Quest* and *Dungeon Adventure*. With more than 600 graphic scenes, excellent atmospheric text descriptions and the new parser system it shows Level 9 at its very best. Also from Level 9 is *Knight Orc* in which you play the part of an Orc hell-bent on reeking revenge on all those vicious adventurers who have decimated your band since adventures first began.

Role-playing bandwagon

Adventure Soft U.K. will soon be releasing the first of the Isaac Asimov sci-fi games. The first is called *Kayleth* followed by *Sword of the Samurai*. Also planned is a series on *Masters of the Universe*. It all sounds very promising.

After a slow start it appears that more and more software companies are beginning to jump on the role-playing game bandwagon. After the success of *Ultima III* it now seems that everybody is producing RPGs. *Ultima IV* will certainly be a massive hit as soon as U.S. Gold can release it. Others in the U.S. Gold pipeline are *Phantasy*, *Questron* and *Gemstone Warrior*. I have seen none of these yet but reliable sources have told me they are very good.

Ariolasoft is due to release *The Bard's Tale* in which you and your loyal band explore the town, cellars and sewers of Skara Brae which is held in the grip of an eternal winter spell cast by an evil old wizard charmingly called Mangar the Dark. With more than 85 spells to use, 16 levels, animated monsters and 3D scrolling mazes, there seems plenty to do in this game.

Overall it looks like being a hectic Orc-bashing adventurer, treasure-finding, spell-casting period for all.

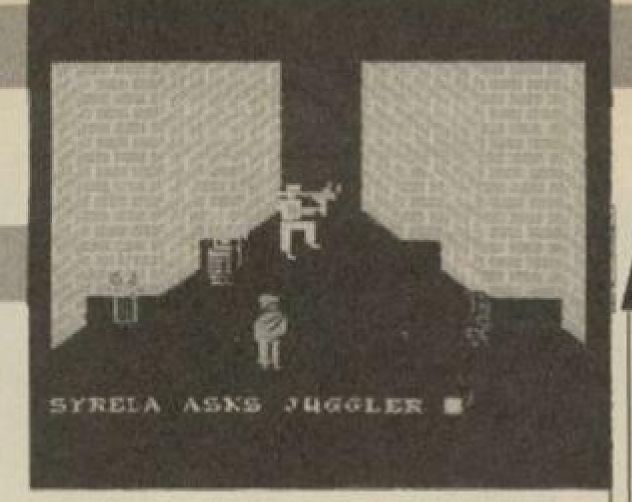
With more and more adventurers playing Infocom games, plus the good news that Activision is to market Infocom in this country, I thought it would be a good idea to start a specialist corner devoted solely to these adventures. Apart from hints, I would like you to send me all those amusing little items which crop up. For instance, try *Rezroving the Turtle* in *Enchanter* for a really funny response.

Adventure helpline

Are you stuck in an adventure? Do you need to let off steam or are you just an adventurer who likes to help other people? If so, this is your corner. Write and let me know what you think of a particular game, what was the worst game you played, what was the best, complaints about software houses, praise for software houses – anything you feel would be of interest to readers.

For instant help, telephone the new Adventureline Hotline between the hours of 7-9pm on weekdays only. Ask for Jackie on 061 339 0092 or send letters, hints, maps to Roger Garrett, Adventureline, c/o Your Computer, 79-80 Petty France, London SW1H 9ED.

MANDRAGORE



► CBM64 Cass/Disc.
Amstrad 6128 Cass/Disc
● Infrogrames ● Role-playing adventure
● Ian Nicol ● £14.95

Let us go back through the mists of time to a land inhabited by stalwart warriors, fair maidens, magicians and all manner of weird and wonderful creatures – a land where bold actions reap their own rewards, a land definitely not for the faint-hearted.

It was in such a kingdom that the wise and benevolent King Jorian ruled. Under his rule the domain existed peacefully but, as we all know, nothing lasts for ever. So it was that one fateful day while Jorian was walking calmly in the countryside that a shower of shooting stars fell from an otherwise clear sky. One struck Jorian, killing him instantly. Immediately the land was taken over by an evil Lord called Yarod-Nor and that is when the troubles began.

To say Yarod-Nor was a tyrannical despot would be an understatement. He was really Bad with a capital B and so it was not long before an intrepid band of fearless warriors decided to do something about him.

As in any typical RPG, your first task is to form your band. It consists of four characters. You decide the occupation of each person – thief, warrior – and what race. There are five races, ranging from



dwarf to human; what sex and, finally, the characteristics of each member, constitution, strength, wisdom and so on. Once having done that you name your members and off you go to solve the mysteries.

One way in which the game differs from a normal RPG is that there is no innkeeper to sell you items needed on the quest. What you must do is find objects either in the various villages or chateaux and then sell them to a purchaser, who is usually found in a village. In that way you will be able to raise sufficient money to enable you to buy what you need.

Once having accomplished that it is time to tackle the adventure more thoroughly. Venturing out of the village finds you in map mode; to reach other parts of the land you type N.S.E.W. The screen scrolls in whichever direction you choose, depicting mountains, rivers and forests. On finding a chateau you enter by pressing 'C'. Each chateau consists of about 30 rooms and dungeons; most have monsters, treasures and mysteries to get/kill/solve before you can hope to reach Yarod-Nor and defeat him and with more than 10 chateaux that is plenty of exploring.

The screen is split into four sections. The left-hand block depicts the area in which you are; top right shows the characters, numbered 1,2,3 and 4; bottom right lists objects and monsters, which are shown as A.B.C.D; the remaining bottom three lines are for text input. Most of the syntax/vocabulary is abbreviated, so only the first two letters of the verb/noun need to be typed-in.

Controlling the actions of each character is a little strange at first but becomes relatively easy after playing for a time. The numbers 1 to 4, assigned to each character, are shown on the right-hand side of the screen, along with experience and life expectancy. So if No. 1 is called Myrtle, pressing key no. 1 will throw that name on the bottom three lines of the screen. Then if, say, you want to attack a monster at B, an Orc in this case, you input AT; the program responds with "Myrtle attacks Orc with sword" but you would need to be carrying a sword before an attack could be successful.

There is also a very useful option in which you can split your party, thus enabling you to search four rooms at once. All you need to do to accomplish this is to type 1 (Myrtle) EX (Explore) N (North) and likewise for the rest of your band but remember, a team member alone is more likely to be killed if attacked by a war party.

The graphics tend to be a little crude but that in no way spoils the overall playability of the game which, at first, takes some getting used to. If you persevere, you will soon find that the adventure has much to offer.

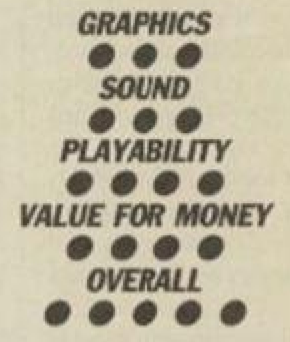
The game is in an attractive box complete with easy-to-understand instructions and represents excellent value. It will be appreciated by the ardent RPG fan and should attract many new followers to RPG.

THE BOGGIT

► CBM64/Amstrad 6128/Spectrum 48K
● CRL Group plc ● Adventure
● Ian Nicol ● £7.95

With the imminent re-release of *The Hobbit* it seems only natural that Fergus McNeil and Co, those masters of the spoof clone, should release *The Boggit*. Once again McNeil puts his tongue firmly in his cheek and takes the mickey out of an established adventure but, as Kenny Everett would say, "all in the best possible taste".

For anybody who has neither read nor played The Hobbit, briefly the plot centres on Bilbo's attempts to travel



across Middle Earth accompanied by Thorin, who tends to be a pain at times. His task is to find and defeat Smaug the Dragon, then return home safely with Smaug's treasure. What McNeil and co-writer Judith Childs have done is to take the original idea and then weave their inimitable brand of humour into it – and a very funny romp it is.

From the moment Grandalf crashes through your front-room window, Tarzan-like, the adventure starts to bubble. Your first problem is to get out of your front room. Once having accomplished that, it is off to visit the Trolls Clearing and have fun with Bernard and Matthew, the most unlikely trolls I have ever had the misfortune to meet, especially when they start to mutter such gems as "He'd look lovely in my crispy batter" or "Bootiful" and guess who they would like to see in the crispy batter?

Text descriptions are more than adequate and the graphics are instant and well-defined. One thing which I thought stood out in the game was the fact that the programmers seem to have looked for a long time at the establishment and adventurers in general and do not miss a trick in taking a large swipe at it – even TV games shows are included. Does "Come on down" ring any bells? In saying that, it is not meant as criticism, merely an observation; adventures should be fun to play and with the likes of Delta 4 on the



scene, I can see sacred cows of adventuring slowly being tossed aside.

My one fear is that with so many clone-type adventures becoming available, it could lead to a general decline in original games. Let us hope that Delta 4 now moves to something of more original content because, when all is said and done, that is what adventuring is about.

MYSTERY VOYAGE

► *CBM64 + disc drive ● Colleen House ● Text Adventure ● Ian Nicol ● £12.95*

I am partial to adventure scenarios which include shipwrecks, great expanses of sea and remote, mysterious islands. *Mystery Voyage* is just such an adventure. The game starts with you abandoning ship; a rickety raft saves you from the same watery fate as your crewmates, so you drift for miles – or so you think – from land, with only a jolly old shark for company. So far so good; the only way to travel is to paddle with your hands. Is it worth it? No problem – but do not try swimming.

You soon discover that land is nearby. By using all points of the compass you will be able to travel to several islands, each with different objects to find and puzzles to solve and each with a death location on it.

Usually I like to be able to read some background information about an adventure I am about to play – it sets the scene and gives some idea of what you are supposed to be doing. Unfortunately, the supplier of this game saw fit only to send me a copy with no other information. That puts me at a disadvantage when attempting to give fair assessment of the game, so if my idea of what I was supposed to be doing is not correct do not blame me.

What I could gather is that to win you must travel round the islands, collecting treasures and other paraphernalia. Avoid volcanos; do not eat apples; make sure you find the water, because in this game you drink and eat a good deal; keep out of dark holes or it is meal-time – and guess who is the meal – until you collect sufficient treasures which, when given to a sea-demon, should enable you to escape from wherever you are.

Examining objects you find, which is essential in any adventure, rewards you only with the inane statement "It's nothing to write home about".

The text-only descriptions are acceptable, though some descriptions are fairly nauseating. For instance, stumbling across a dead demon "whose intestines are slowly being eaten by large maggots" might make you vomit. The location then includes "A foul poo of evil-smelling vomit" – just the thing

GRAPHICS
None
SOUND
●
PLAYABILITY
● ●
VALUE FOR MONEY
●
OVERALL
●

before lunch. There must be some reason behind that but, try as I could, I could not find it and I am afraid that goes for the rest of the game – more of a mystery trip than a Mystery Island and I was never one for mystery trips.

LAPIS PHILOSOPHORUM

► *CBM64/Atari + Disc Drive ● Ariolasoft ● Adventure ● R. Garrett ● £14.95*

Long ago, in the small country of Alkanien there lived a wise and kindly king, Gieselmer Gutfreid. It appeared that the good king had everything he could wish for but one thing marred his otherwise contented life.

Gieselmer longed for an heir to his throne. His first wife had died suddenly of a mysterious illness and, after re-marrying, his second wife showed no sign of providing for his hopes. The years rolled by and because no heir was born the king had no choice but to ask his stepson to become heir to the throne.

That was about the worst possible thing Gieselmer could have done. It transpired that his stepson was very ambitious and did not want to wait until the king died so, in an attempt to gain the throne quickly, he poisoned the king.

Of the many wise magicians who lived in those days, none could heal the ruler. There was one person who had the ingenuity and courage to try to find The Philosopher's Stone. Nobody knew where the stone was but legend had it that not only could the stone turn base metals to gold but, when in powder form, it was mixed with water and, if drunk, could cure any illness. Your quest is to find the stone and save the king.

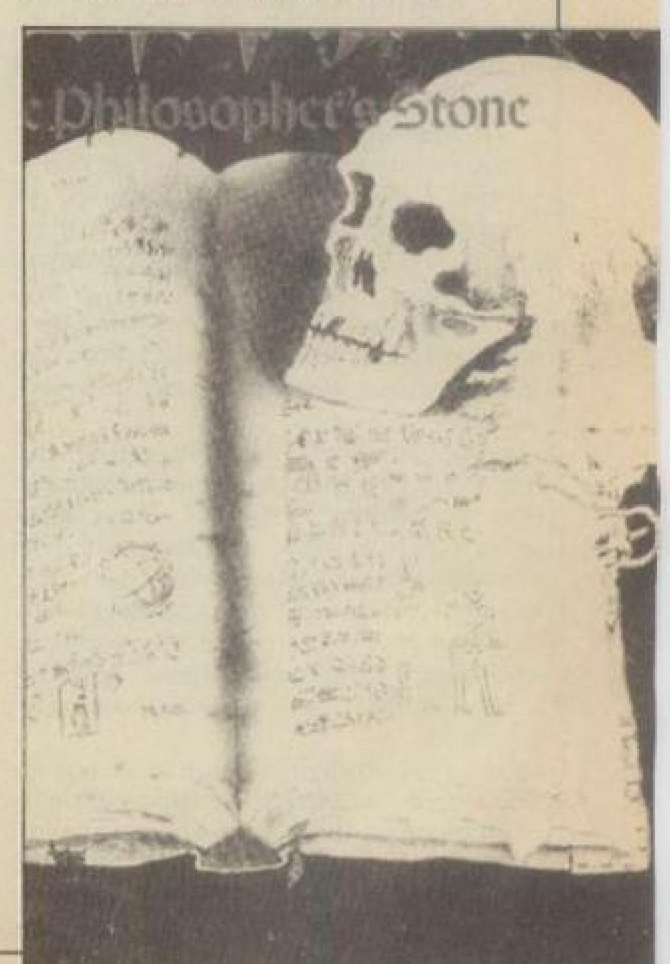
So much for the background to the latest release from Ariolasoft. It is not a very original storyline but the text descriptions and very fast responses in speed of graphics and screen output make the game a cut about the average. There seems to be a fair-sized vocabulary, so that permits you to input the now standard verb/noun/adjective-type sentence.

GRAPHICS
● ● ●
SOUND
● ●
PLAYABILITY
● ● ●
VALUE FOR MONEY
● ● ●
OVERALL
● ● ● ●

Graphics, which are classed as superb on the back cover, are of the block/line type which tend to give the game a dated look. I would not go so far as to they are more than average.

The problems are not particularly difficult and I feel the game is aimed at the less-experienced adventurer but as there are seven routes to winning, there could be many surprises in store.

Overall, The Philospher's Stone should appeal to most adventurers; it contains most of what we look for in an adventure. My only criticism is that it is rather expensive, considering some of the good adventures available at the moment and at much less cost.

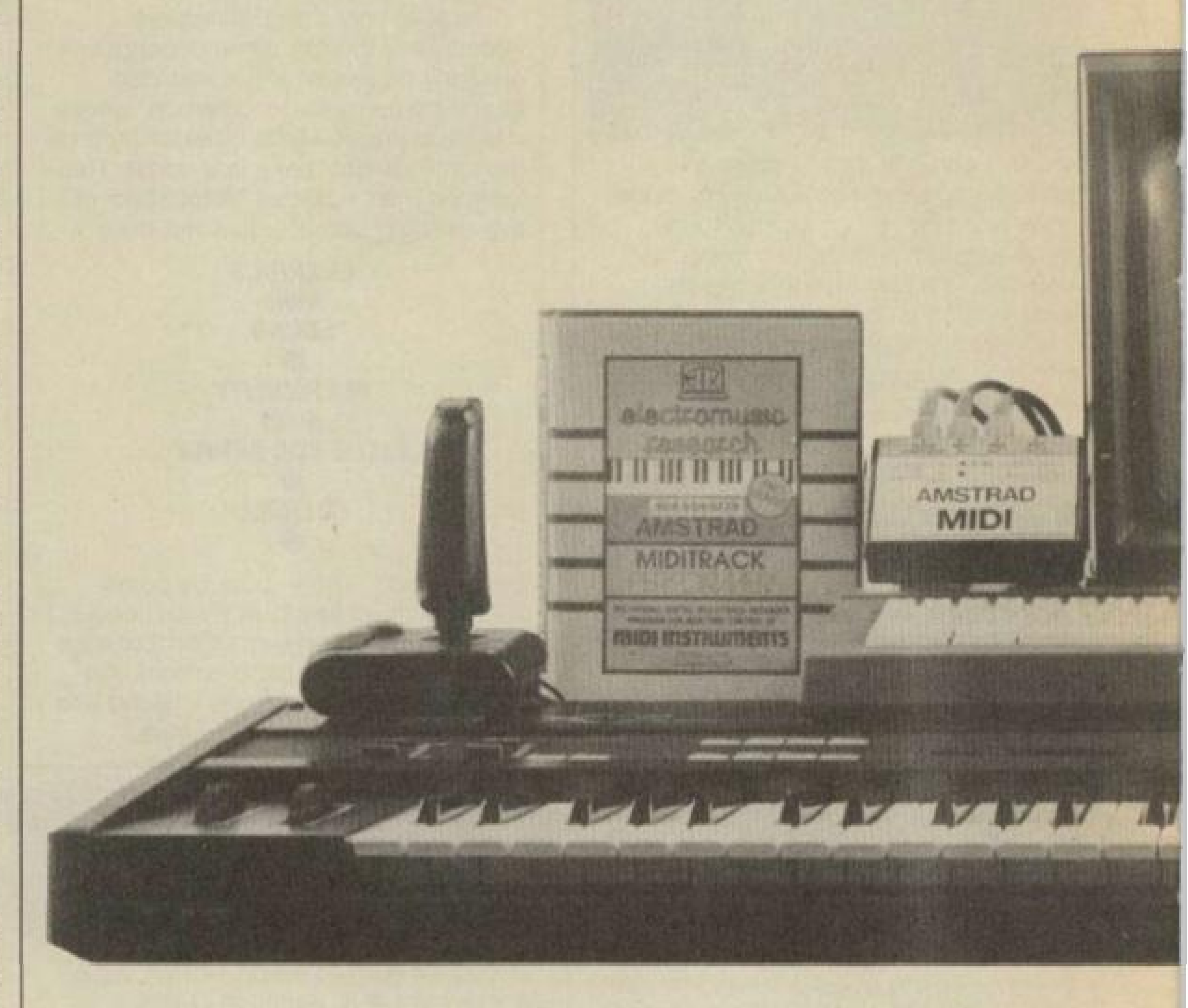


Midi here, Midi there, Midi programs everywhere. Well, yes, but only if you have the proper computer. The favourite is undoubtedly the Commodore 64, for no other reason than there are more Commodore 64s in the world than any other computer. Software producers know they have a good user base at which to aim their software.

There are many other computers and many owners have been waiting, often in vain, for an enterprising software house to offer a Midi package. To the rescue of Amstrad computer owners everywhere there is EMR.

In our August issue we looked at some of the EMR BBC Midi software. One of its latest releases is a Performer program for Amstrad CPC464, 664 and 6128 computers. It is similar in many ways to other EMR Performer programs but it has one or two differences.

The Performer allows you to record on sequencer packages, which means you enter notes into the system live, as you play. That reveals all the little mistakes which generally go unnoticed. There is nothing worse than listening to a recording of your playing to make you realise how poor you are. All is not lost, however, because the Performer has ways and means of helping to tidy your recording.



A profession

Bridging that gap

The Midi Interface which bridges the gap between computer and synth has a Midi In, two Midi Outs and a Clock Start/Stop socket. It is attached to a ribbon cable which plugs into the cartridge slot so there is no bulge between the computer and the monitor. Two LEDs show when data is being received and transmitted.

All operations are controlled from a single menu screen which keeps things simple. Fashionable icons are used to describe the program functions and a plastic-covered sheet describing each icon acts as a Quick Screen Guide, but a few minutes' use and you will know what they all mean. Movement round the screen can be with either the cursor keys or a joystick.

With your Midi synth plugged-in, the first thing you will want to do is load and play the demonstration files. There were three rather brilliant demonstrations on the tape and an audio version, too. That included drums and what sounded like umpteen synths but which was probably only two – impressive indeed. Just the kind of thing to spur you to creations of your own.

The Performer allows you to record on up to eight tracks. You can think of them like the tracks on a multi-track tape recorder but you can do far more with digital tracks than with audio ones. The tracks are numbered down the left side of the screen and six control options are listed along the top – Play, Channel, Loop, Control, Pitch and Arrange.

Recording is a straightforward process and you can assign each track to a different channel. Unlike other Performer programs, this does not allow any Midi mode changes and is fixed in polyphonic mode. That is the mode in which 99 percent of synthesisers operate, so they should all work well. It also avoids any confusion over mono mode and multi-timbral instruments such as the Casio CZ synths and the JVC KB800. Multi-timbral instruments can sound more than one voice at a time and are ideally-suited to making Midi music on a budget, because you have four or more voices for the price of a single synth.

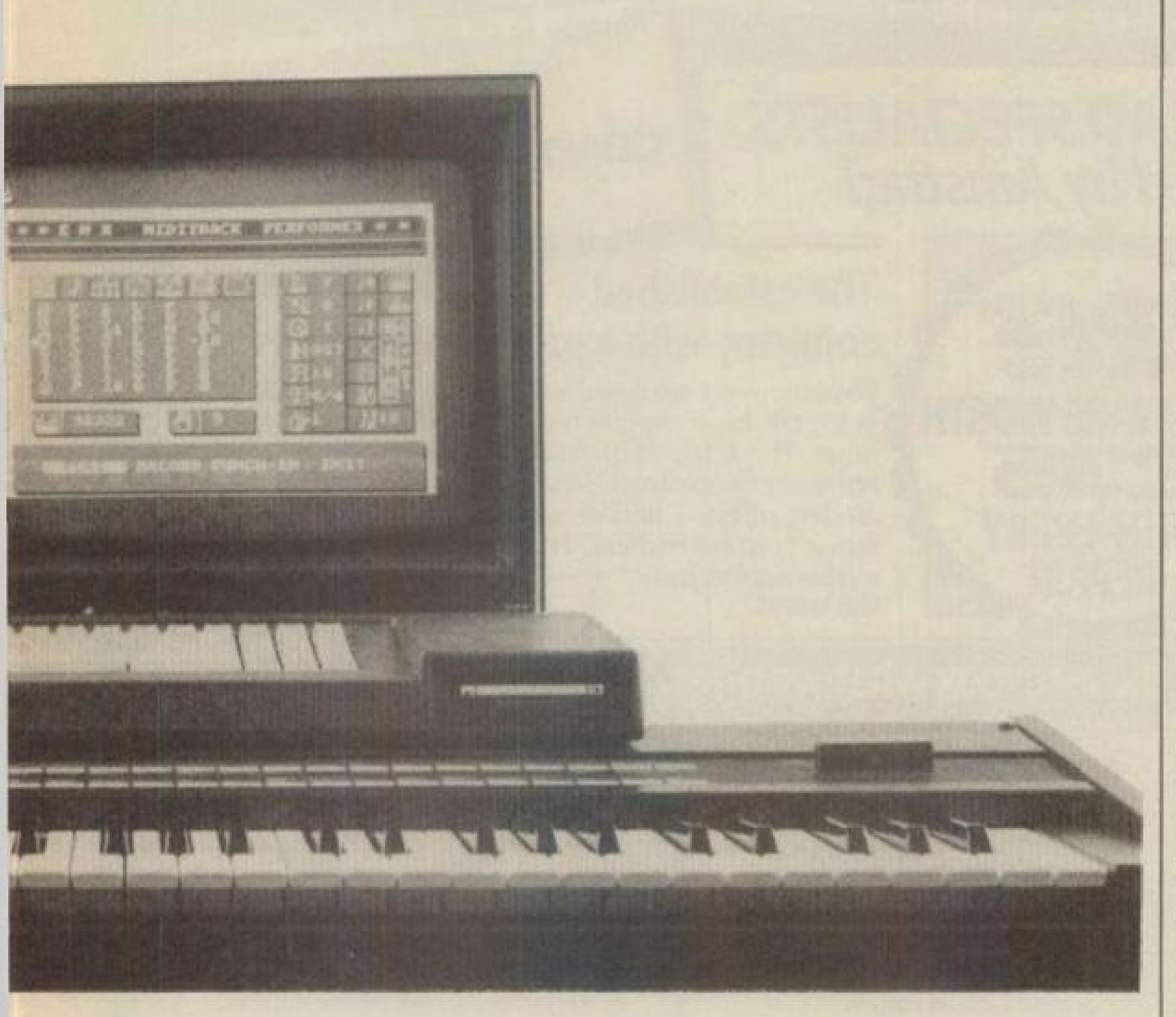
If your keyboard technique is not so polished as you would like, the Performer can help. First, you can record a piece slowly and speed it on playback to its proper tempo. Second, there is a Punch-In facility which lets you drop in to a track and continue recording from there. That prevents having to record the whole track again and it lets you extend an existing track.

Clever option

Another clever option is the Time Correct feature which will put notes on the beat as you play them. The resolution can be altered from quarter notes to 32nd notes and if you have already recorded a piece it is still possible to correct the timing by copying it to another track using the Track Merge facility.

Track Merge is the digital equivalent of audio bouncing tracks. It is not completely software-driven, as you have to plug the Midi Out socket into a Midi In socket. Having done that, you can merge up to seven tracks into one.

After a track is recorded you can make it Loop, in which case it will repeat on playback until the longest non-looping



al performer

The EMR Performer is an excellent value-for-money package which bridges the gap between Amstrad CPC computers and Midi-compatible instruments.
Ian Waugh reports.

track has finished playing. You can use the feature to produce rhythm tracks.

The Control section lets you filter-out unwanted performance control data. The storage of effects such as Aftertouch (Pressure) and Velocity sensitivity requires plenty of bytes and their omission can save up to one-third of the memory of each track.

The Pitch option lets you transpose a track up or down by 12 semitones. If you want to transpose it further, repeat the process. Apart from its usefulness in arrangements, you can use it to play along with transposing instruments such as the trumpet and saxophone.

When your recording is complete you can alter the channel through which each track will play back. Normally you will set a different channel for each synth voice and you can mute individual tracks on playback if required.

A special function called Arrange takes the sequencing concept a stage further and lets you build a composition by making the tracks play in a certain order. You could have a repetitive bass riff on track one which you also want to use as an introduction. A rhythm accompaniment could be on track two and solo lines could be on tracks three, four and five. The arrangements follow the tracks set to Play on the menu screen, so the first thing to do would be to set track one to Play and mute the rest. The first arrangement, adding the rhythm, would then be tracks one and two. The second arrangement would be tracks one, two and three. The third could be tracks one, two and four, and so on. You can make up to 64 arrangements. It is very easy in practice and there is no way you could do anything like that with an audio recording – and retain your sanity.

On the right of the screen are other features which I will mention briefly. A metronome beat can be switched on or off. It plays through any instrument set to channel one and you can alter its pitch. You can set the number of beats count-in from 0 to 9. You can switch the clock from internal control to an external source, such as a drum unit. Tempo can be adjusted while a piece is playing, too. A piece can be made to repeat up to 255 times.

A beat in time

You can alter the time signature but as there is no traditional notation that is just to help you with your beat counts. A Text option lets you store a few words about the piece along with the music data. If you are anything like me and never keep paper records, although we all know we should, store the version number of the piece and what instruments are supposed to be playing on which tracks. It prevents a good deal of head-scratching and frustration. Finally, you can set the number of the bar from which you wish playback to start. Of course, you can load and save your music, verify a saved file and rename and delete a file on disc.

The EMR Performer is available on disc or cassette and costs £49.95. The Midi Interface is £79.90, so the two will cost £129.85. At the moment, there is no other Midi software for the Amstrad so comparisons, odious though they may be, can be made only with programs written for other computers. On that account, EMR scores very well, as both hardware and software are generally cheaper by up to 50 percent. Some of the other packages have more facilities, such as step-time input and greater editing control but EMR will be releasing separate packages to do that kind of thing and an Amstrad Editor, Notator, to print-out the music, and step-time Composer will be available around Christmas.

The Performer is excellent value and has many facilities to help get the most from real-time recording. It can be used by the professional, on stage, in the home and for educational purposes. A veritable boon for the Amstrad owner who wants to make the most of Midi.

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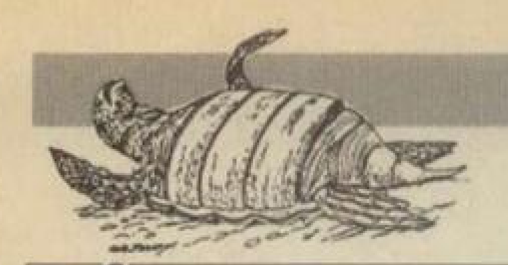
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DR LOGO

In this final part of Using Dr Logo, we look at one last example which makes use of most of the features which make Logo different from other languages such as Basic. Recursion, lists and property lists combine in this month's program. It is really only when you see these three made-for-each-other elements of the language working together that it is possible to appreciate the power of Logo.

In this month's example, lists and property lists are used to construct a complex – well, in other languages it is complex – data structure called a network and recursion is used as a very natural way of manipulating it. The resulting program using these techniques is usually referred to as a semantic net and has its origins in the esoteric field of artificial intelligence but it is great fun to use.

You can tell the program various pieces of information and ask it questions and it will answer them to the best of its ability. So long as you restrict your questions to the type about which it knows its answers are fairly convincing – see figure three for a sample dialogue.

The simplest form of information store records fast facts but for most purposes the relationships between the facts are what is important. A telephone directory may store the names and addresses of all the members of a family but it needs a diagram of the family tree to show who is related to whom. A piece of software which can record data and the relationships between the data is called a relational database, which works generally by using pointers to link items to form a network. A relational database, however, is not the final word in increased sophistication.

Figure 1.
A semantic network.

```
HEAD
 |
 |  HAS
 |
SAM- - - -PERSON
 |   IS A   |
 |  IS A    |  HAS
 |          |
MALE       HAIR- - -SOFT
                 IS
```

The links used by a relational database to associate one item of data with another are all of the same type. They are anonymous arrows or pointers which bind items of information together without indicating what causes them to be joined. That is obviously insufficient to represent the complexities of the world, since a human memory is very different because it links items with named relationships. In figure one the relationships between the items of information SAM, PERSON, HEAD, HAIR, SOFT and MALE are shown.

You can see that the relationship between SAM and PERSON is different from that between SAM and HEAD – SAM **IS A** PERSON but SAM **HAS** HAIR. The fact that the relationships IS A and HAS are different really becomes apparent only when the memory is being searched. If you want the question "DOES SAM HAVE HAIR" answered, then as well as looking at the item SAM for HAS relations you have also to examine the items connected to SAM by IS A relations. Thus the answer to "DOES SAM HAVE HAIR" is found by examining the HAS relationships from PERSON. That is:

```
SAM - - -IS A- - ->PERSON- - -
HAS- - ->HAIR
```

means that SAM has HAIR. That type of inference depends on the properties of the relationships involved and it is called property inheritance. It is property inheritance which allows us to follow a path through the memory consisting of similar items.

The type of memory, using named relationships, is called a semantic network. A general semantic network would have to be very complicated to represent much of the world but using Logo property lists it is very easy to implement a small demonstration semantic network.

To produce a program which will manipulate a system of items and named relations it is necessary first to solve the problem of how to represent the items and the named relationships. The simplest way is to create variables of the same name. Representing the relationships is slightly more difficult but it seems obvious that the property list of the variable concerned should be of some use.

We could use the property list by recording the names link so that the name is the property and the item to which it is connected is its value. To represent SAM HAS HEAD we would create a variable called SAM and store the property pair HAS HEAD in its property list, with HAS as the property name and HEAD as its value.

Using the property list in this way works well but there is a difficulty. You can use a property list to record more than one type of named relationship. SAM HAS HEAD and SAM IS A PERSON could be represented in a single property list:

```
SAM   [HAS HEAD IS A PERSON]
```

There may be more than one link of the same name and that is more difficult to represent. If you add SAM IS A MALE to the list of relationships it cannot be represented using the simple method described because the IS property can have only one value, either A PERSON or MALE. The problem can be solved by realising that a property list is a list of pairs of items; the first item is the property name and the second is the property value and that value can be any single data type, including a list or a list of lists and so on.

Thus the final method of representation is to use the property list to record the names of the relationships as property names and the items to which the relationships point are stored as a list which is the value of the property. The relationships SAM HAS A HEAD, SAM IS A PERSON and SAM IS MALE would be represented as:

```
SAM   [HAS [[A HEAD]] IS
[[A PERSON]] [MALE]]]
```

That looks complicated but there are still only two properties in the property list HAS and IS and their values are:

```
HAS   [[A HEAD]]
IS    [[A PERSON] [MALE]]
```

That is the value of each property is a list of lists.

Now that the problem of representing the structure of a semantic net has been solved, all that is left is to determine how information gets into it and how information can be retrieved. The simplest way of allowing the user to store information is via the English sentence construction:

```
x  relation  y
```

where x and y are items to be stored and connected by the link named "relation". For example:

```
SAM IS A PERSON
SAM IS MALE
SAM HAS HEAD
PERSON HAS HAIR
HAIR IS SOFT
```

describe the information shown in figure one. Using this limited form of English ensures that it is possible for the program to separate x and y from the relation. The rule used is that the first word is item x, the last word is item y, and any words between form a description of the relationship.

Once information has been entered the memory is useful only if it can be used to answer questions about its contents. Using the form of representation described, it is possible to implement many types of question-answering routines but, to keep things simple, the program attempts only to handle the following three types of question:

```
TELL ME ABOUT x
DOES x HAVE y
IS x A y
```

Once again, because of the restricted format of those questions it is easy for the program to detect the type of question and the items mentioned in it. The first question is detected by the first word being TELL and the

Continued on page 66

Continued from page 65

last word is taken to be x; similarly the second and third questions are detected by the first word being DOES or IS respectively and the second word is taken to be x and the last word is taken to be y.

What happens when one of the three questions is detected varies according to the question. To answer the TELL ME ABOUT x question the program has to print-out a suitably formatted property list for the variable x. To answer the question completely the program should follow all of

where :inf contains the property list of a variable. That extracts the ith item, which is the list of lists of the property, the jth item of the list, which is a simple list, and then finally the kth item of this list which is a word. For example, if :inf is the property list of SAM and i is 4, j is 1 and k is 2 "new_name is set to PERSON as shown in figure two.

To answer the DOES x HAVE y question it is necessary not only to examine the direct HAS relationships but also the HAS relationships of items connected to X by IS

Figure 2. Extracting "new_name.

SAM	**[HAS [[A HEAD]] IS [[A PERSON] [MALE]]]**
item i	**[[A PERSON] [MALE]]**
item j	**[A PERSON]**
item k	**PERSON**

the relationships with x through all of the net. So the program response to TELL ME ABOUT x is to print every connection x has with everything else in the memory.

Implementing this search is a matter of recursion. If tell_inf :name is a procedure which will print the property list of variable :name you can search the entire network by making tell_inf call itself for each name in the property list of :name. The rough outline of tell_inf is:

```
to tell_inf :name
print the property list of :name for
each name in the property list
  tell_inf :newname
end
```

If you look at the tell_inf procedure in the program listing you should be able to understand what is happening. The only really difficult lines in the entire program are those like:

```
make "new_name item :k item :j
item :i :inf
```

A relationships. So DOES SAM HAVE HAIR would be answered by the following chain of relationships:

SAM - - -IS A- - -> PERSON - - -HAS- ->HAIR

Similarly the IS x A y question has to be answered by following IS A relationships. If we add PERSON IS A HUMAN to the memory, the question IS SAM A HUMAN would be answered by the following chain of relationships:

SAM - - -IS A- - -> PERSON - - -IS A- - ->HUMAN

The finished program can be seen in listing one and it is suitable for both versions of DR Logo but remember that if you are to type it into version two you will have to ignore the formatting of the procedures as explained in part one of the series. The purpose of each of the procedures used in the finished program can be seen in table one.

Table 1.

Procedure	Action
main	Get input and call the correct procedure
is	Get ready to answer IS A question
does	Get ready to answer DOES question
add_inf	Add information
tell_inf	Recursive part of answering TELL question
does_inf	Recursive part of answering DOES question
is_inf	Recursive part of answering IS A question
tell	Get ready to answer TELL question

The program described implements only a few of the possible relationships in a semantic net and yet it still behaves in an interesting way, as the following output indicates. For clarity, all the input data and questions are shown in upper-case and the computer responses are in lower-case. Note that the program is started by typing MAIN and it uses * as a prompt for input.

```
?MAIN
*SAM HAS A HEAD
*SAM IS A MALE
*SAM IS A PERSON
*PERSON HAS HAIR
*HAIR IS SOFT
*IS SAM A PERSON
yes
*DOES SAM HAVE A HEAD
yes
*HEAD HAS BLUE EYES
*PERSON IS HUMAN
*IS SAM HUMAN
yes
*DOES SAM HAVE BLUE EYES
yes
*DOES PERSON HAVE BLUE EYES
not as far as I know
*IS SAM SOFT
no
*QUIT
?
```

A great deal can be done to improve the program. It should be possible to recognise different categories or classes of objects in the store. SAM is a specific object but PERSON is a class to which other objects can belong. Such classes can, in theory, be detected by following IS A relationships.

You can also introduce new relationships and include them in question processing. SAM IS A PERSON implies that SAM has all the items PERSON has but the reverse is not true. In fact, the new relationship that is necessary is:

PERSON EXAMPLE IS SAM

Given that relationship, any items SAM HAS might also be items PERSON HAS. In this way you could arrange for the answer to DOES PERSON HAVE BLUE EYES to be AT LEAST SOMETIMES. If other examples of PERSON also proved to have BLUE_EYES you might feel justified to conclude that PERSON HAS BLUE EYES.

By experimenting with the program you will discover many ways of examining and re-organising the relationships between the items. There is one danger of which you should be aware while using the program – circular relationships. A relationship of the form SAM IS A PERSON and PERSON IS A SAM will cause endless trouble.

We hope that as a result of reading the series you feel that Logo is a language for more than just playing with turtle graphics. Logo graphics are fun but for a real challenge using lists and recursion effectively is difficult to beat.

LISTING ONE.

```
to main
label "start
 type "*
 make "inp rl
 if (first :inp = "quit) [go "out] []
 if (first :inp = "tell)
 [tell
  go "loop_end
 ]
 []
 if (first :inp = "does)
 [does
  go "loop_end
 ]
 []
 if (first :inp = "is)
 [is
  go "loop_end
 ]
```

DR LOGO

```
 []
 add_inf
label "loop_end
go "start
label "out
end

to is
(local "inf1 "desc1 "ans "nam1)
make "nam1 item 2 :inp
make "inf1 plist :nam1
make "desc1 bf bf :inp
if (emptyp :inf1)
 [type [I don't know anything about]
  type char 32
  pr :nam1
 ]
 [make "ans is_inf :nam1 :desc1
  pr :ans
 ]
end

to does
(local "inf1 "desc1 "ans "nam1)
make "nam1 item 2 :inp
make "inf1 plist :nam1
make "desc1 bf bf bf :inp
if (emptyp :inf1)
 [type [I don't know anything about]
  type char 32
  pr :nam1
 ]
 [make "ans does_inf :nam1 :desc1
  pr :ans
 ]
end

to add_inf
(local "name "con "value)
make "name first :inp
make "con item 2 :inp
make "value gprop :name :con
make "value fput bf bf :inp :value
pprop :name :con :value
end

to tell_inf :name
(local "inf "i "j "k "ct1 "ct2 "new_name)
make "inf plist :name
make "ct1 (count :inf) / 2
make "i 2
repeat :ct1
 [
 make "ct2 (count item :i :inf)
 make "j 1
 repeat :ct2
  [
  type char 32
  type item :i - 1 :inf
  type char 32
  pr item :j item :i :inf
  make "k (count item :j item :i :inf)
  make "new_name item :k item :j item
    :i :inf tell_inf :new_name
  make "j :j + 1
  ]
  make "i :i + 2
 ]
end

to does_inf :nam2 :desc
(local "inf "ct1 "ct2 "ct3 "i
 "j "l "m "p "new_word)
make "inf plist :nam2
make "ct1 (count :inf) / 2
make "i 1
repeat :ct1
  [
  if (item :i :inf = "has)
   [make "ct2 (count item :i + 1 :inf)
    make."j 1
    repeat :ct2
    [
    if (item :j item :i + 1 :inf = :desc)
     [op "yes]
     []
    make "j :j + 1
    ]
   ]
   []
  make "i :i + 2
  ]
 make "l 1
 repeat :ct1
  [
  if or (item :l :inf = "is) (item :l :inf = "has)
   [make "m 1
    make "ct3 (count item :l + 1 :inf)
    repeat :ct3
     [
     make "p count item :m item :l + 1 :inf
     make "new_word item :p item :m item :l + 1 :inf
     make "res does_inf :new_word :desc
     if (:res = "yes) [op "yes] []
     make "m :m + 1
     ]
    ]
   []
  make "l :l + 2
  ]
 op [not as far as I know]
 end

to is_inf :name :desc
(local "inf "ct1 "ct2 "i "j "k "new_word)
make "inf plist :name
make "ct1 (count :inf) / 2
make "i 1
repeat :ct1
 [
  if (item :i :inf = "is)
  [make "ct2 (count item :i + 1 :inf)
   make "j 1
   repeat :ct2
    [
    if (item :j item :i + 1 :inf = :desc)
    [op "yes]
    []
    make "k count item :j item :i + 1 :inf
    make "new_word item :k item :j item :i + 1 :inf
    make "res is_inf :new_word :desc
    if (:res = "yes) [op "yes] []
    make "j :j + 1
    ]
  ]
  []
 make "i :i + 2
 ]
op "no
end

to tell
(local "nam1 "inf1)
make "nam1 item count :inp :inp
make "inf1 plist :nam1
if (emptyp :inf1)
 [type [I don't know anything about]
  type char 32
  pr :nam1
 ]
 [pr :nam1
  tell_inf :nam1
 ]
end
```

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Spectrum

TAPE SP09

HAL

Machine: Spectrum 48K
Program Type: Programming utility
Author: Jonathan Dye

HAL is a complete new language for the Spectrum 48K. Once compiled, HAL programs can be used as extensions to your own Basic programs by including LOAD CODE and RANDOMIZE USR instructions.

In addition to low-level arithmetic directives, most of the Spectrum sound and graphics commands have their equivalent HAL statements, making it particularly suitable for writing routines for fast-action games.

TAPE SP09

SURROUND

Machine: Spectrum 48K
Program Type: 2-player arcade
Author: Norwegian Software Design

This is a two-player version of the classic game of Surround. Written fully in machine code, the action is fast and furious. Each player controls a roving point leaving behind it a destructive light trail.

TAPE SP10

DATABANK

Machine: Spectrum 48K
Program Type: Business/Home use
Author: Christopher Lewis

This is not a database program but a databank, with the ability to hold up to 55 pages of information. Each page can be assigned a name of up to 25 characters and can hold up to 500 characters of information. The program includes all the necessary facilities to create, edit, save and load these fully-indexed pages.

TAPE SP10

POTTY POSTMAN

Machine: Spectrum 48K
Program Type: Arcade
Author: Mark Jones

In this game you must guide Paul the Potty Postman around Terror Lane to complete your round and save Paul's job.

Dogs are to be expected and Gnashalot is one of the worst. In addition, however, you will have to negotiate aliens, trees and even man-eating radios.

CBM 64

TAPE CBM09

TUG OF WAR

Machine: CBM64
Program Type: 2-player arcade
Author: Paul Randall

This two-player, keyboard-controlled game, will have you battling in a more friendly situation than the majority of computer games.

It is a game of fast reactions and co-ordination. Having taken the strain, each team must attempt to pull the other by pressing the appropriate key when the PULL sign lights. The first to hit his key gains the advantage but be careful of pulling too soon or your whole team to slip and fall.

TAPE CBM09

BRAG

Machine: CBM64
Program Type: Card simulation
Author: Lionel Jack

This is a complete simulation of the card game three-card Brag. You control one hand and must beat the other three hands, all controlled by the computer.

INSTRUCTIONS FOR USE

Software Exchange tapes are not supplied with any paper documentation – all instructions relating to the use of the software are provided as text files at the start of the programs.

To load the software the following instructions should be followed unless otherwise stated within the description of the software.

AMSTRAD CPC
Press CTRL – control key – while at the same time holding down the ENTER key.

CBM64
Press the SHIFT AND RUN/STOP keys.

SPECTRUM
Type LOAD"" then press the ENTER key.

BBC
Type CHAIN"" then press the RETURN key.

»Software Exchange«

CBM 64

TAPE CBM10

MINI-MON

Machine: CBM64
Program Type: Programming utility
Author: Simon Carter

Mini-Mon is a versatile code loader, with routines for saving, loading, viewing, printing, entering and check-summing both hexadecimal and decimal code.

You can enter code in hex or decimal, from any specified start address, with a variable number of bytes per line. A checksum can be added to this data, if required. Viewing gives the same options, with a variable scroll speed.

For the machine code programmer, this utility can be used in place of virtually every other code loader and is useful as a monitor.

TAPE CBM10

LIGHTNING STRIKE

Machine: CBM64
Program Type: Arcade
Author: John Taylor

Lightning Strike is a Scramble-type game where you must guide your attack helicopters through ever-decreasing caverns, past a barrage of enemy forces of helicopters and aircraft. Many of the routines are written in fast-action machine code, so the action is definitely fast. Your missiles will move up and down with your helicopter, so they can be guided on to their targets.

The game is controlled by joystick, and an exceptional feature allows the game to be changed for a second player. In this case, the opponent controls the enemy helicopter from another joystick.

Amstrad

TAPE AMS06

SECURED SYSTEM DATABASE

Machine: Amstrad
Program Type: Business/Home use
Author: R. Millward

This Amstrad database utility allows records with up to 16 fields. A new database file may be created, and field names of up to 20 characters can be given, which may be altered at a later date. Records may be added, altered or deleted, with up to 65 alphanumeric characters per field. Other facilities allowing conditional searching, browsing, saving and loading are also available.

One special feature of the program is that the user optionally may add a code and password to prevent other people accessing the data.

TAPE AMS06

SOUND DESIGNER

Machine: Amstrad
Program Type: Utility
Author: Jim Aboulzelof

This handy utility will help you create sounds for use in other programs, such as your favourite games. All the sound information is displayed on the screen, including all the Amstrad Basic sound commands. The appropriate values can be changed and heard using the cursor controls. Once you have created that perfect sound, the values may be printed or saved, for later loading back into the program. Full instructions are included.

BBC

TAPE BBC04

BIRD OF PREY

Machine: BBC B
Program Type: Arcade
Author: N. Sheard

In this game you take the part of an animated golden eagle with young on the nest. At each stage you must guide the eagle to collect two items of prey, represented by owls, fish, rabbits, mice, birds and bats. You must, however, be careful to avoid collisions with the background and other moving foreground objects.

This game is graphically and musically excellent. The graphics are colourful, being drawn and filled for each of the 20 stages, all of which must be completed before the young will leave the nest. The music is three-channel and interrupt-driven.

TAPE BBC04

KUNG-FU

Machine: BBC B
Program Type: Arcade
Author: David Chung

This is a martial arts program featuring punches, kicks and jumps. You play the role of Lewis Lee, an apprentice of the famous Martial Arts Club of Hongkong. You had just have your 'Masters' examination, and are about to celebrate, thinking you have fared exceptionally well. Unknown to you, your superiors are planning one final surprise test.

Though written in Basic, the program is extremely fast and even includes delay loops to make it playable. Of course, as with all our programs, they are unprotected, so you could easily remove these, if you consider yourself a real hero.

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Garth Hill School

The only computer at Garth Hill School, Bracknell three-and-a-half years ago was a Research Machines 380-Z. Today it has more than a quarter of a million pounds worth of equipment, some donated by industry but a good deal paid for by fund-raising events by pupils, parents and members of the local community.

Once in danger of closing because of rapidly-falling rolls, the school has now doubled its intake and is acclaimed internationally as Europe's leading exponent of information technology in the school environment.

A computer centre, housing 19 BBC microcomputers, was the school's first major computer venture. When it was partially complete, Prestel decided to use the school as a venue to launch its first European telephone link. The resulting publicity led to Acorn deciding to use Garth Hill as a test bed for new products and the centre was soon fully-equipped.

More and more people became interested in the school. Japanese television recorded a documentary about it and the BBC television program Micro Live was so impressed that an entire program was recorded there.

In addition to Acorn, which still has close links with the school, recently providing an Econet Level 3 hard disc system, several other companies have donated equipment including software, touchpad equipment and disc drives. Educational software for most subjects is available via the terminals in the centre and all the students can work there and learn more about computing from an early age.

In their first two years, all pupils attend computer awareness courses, designed to give a gentle introduction to information technology. In the third year they study an IT business course before choosing their final options for the fourth year.

Stanley Goodchild, pioneering Garth Hill headmaster, is aiming for a school of excellence. "By that I do not mean one which contains only the most able pupils but one in which, whatever a student's ability, all available talents are fully-exploited. That way, when the pupils leave, they are as well equipped as possible to deal with the problems they are likely to encounter in a working environment," he says.

Garth Hill has converted one of its classrooms into a high-tech office so that pupils may become familiar with the type of equipment used in the fast-changing office environment. Pupils from the third year onwards, studying any of the school's business and information technology courses, gain experience of word processing, data processing, business computing and electronic mail, in addition to the more traditional subjects such as typing, audio-typing and general office management. Goodchild explains:

"We believe all our pupils, on leaving school, will require keyboard skills in their work. The traditional idea of the business studies room is one where there are rows upon rows of typewriters and that is often divorced from the real world. Our high-tech office is based on a completely different concept. It has been developed after close consultation with the world of industry and commerce. We believe it is a more realistic way of preparing young people for the modern world."

Apple aid

A separate room houses 18 Apple Macintosh business computers. It was built and equipped as a joint project between Garth Hill, the Manpower Services Commission and Apple Computers, which not only provided all the equipment but also offered advice on the design of the room. It allows some of the older pupils to gain experience of running professional software packages, such as they would use in a modern office. Younger pupils also use the machines and find the WIMP environment easier to use.

Garth Hill believes in keeping close links with industry. As with many other schools, pupils can spend time on work experience but, unusually, some of the staff are also encouraged to attend in an attempt to keep up-to-date with the latest developments in their areas.

There are also strong links with the local community and other schools in the area. A bus containing 14 microcomputers travels round the area, taking a taste of new technology to those outside the school and many local firms send speakers to Garth Hill to talk to pupils as part of a government-funded Technical Vocational Education Initiative scheme.

Garth Hill has been involved in the research and development of many systems, including a major database dedicated to schools. The Times Network for Schools is a low-cost communications network containing information of interest to schools and educational establishments. Based on the public electronic mail and notice-board service offered by Telecom Gold, TTNS has a central database built from educational and outside resources. resources.

For an annual all-inclusive fee of £187, a school has unlimited access to the network. That represents a considerable saving for schools compared to other commercial databases which charge for each minute on-line and for storage of data.

Several pupils attending the school have personal computers at home. Parents were enthusiastic about TTNS and enquired about the possibility of having their own database containing information about the school. That led to the parents' database being established in August, 1985.

Communications software and modems at greatly-subsidised prices were provided by the school to encourage parents to log on to the system. Information about school sports fixtures and events for parents and pupils, as well as the school prospectus and diary, are available on the database.

parents' database is planned, as are many projects which will help to make the curriculum relate to the needs of industry and commerce. They include a new drama studio where pupils may gain experience of computerised lighting systems, a high-tech library and two VAX machines for studying CAD programs.

Main objective

In addition, this month a £300,000 research project into school administration starts. With so much technology in operation, some people may be inclined to regard Garth Hill as a factory, producing hundreds of computer operators each week. The headmaster, however, is adamant that other subjects in the curriculum do not suffer as a result of the commitment to computers in education.

"It is not our aim to produce programmers. Our objective is to make full use of information technology as part of the teaching and learning process. That will ensure that our pupils are better equipped to find jobs," he says.

There can be little doubt that the system works. Three years ago more than 30 pupils failed to find jobs before September. Last year the figure fell to two.


Jeff Naylor.

The road to opportunity

We asked Jeff Naylor for advice for those seeking computing careers.

To establish a career in computing many people believe you need many science-based qualifications. While such a background will certainly not damage your chances of finding a job in the computer industry, such a statement cannot be considered completely true. Jeff Naylor took O levels in a broad range of subjects, including commerce, French and English literature. He then studied for A levels in technical drawing, Spanish, economics and mathematics, and he is now senior tutor for the BSc course in computing science at Thames Polytechnic.

His interest in computers began when his A level mathematics teacher found a dusty old computer in a cupboard and challenged him to write some programs. After a little practice, he managed to produce simple routines to create sequences of flashing lights. An interest began which was to shape the rest of his career.

Naylor decided to look for a suitable course of study. "At the time, there were few universities offering computer science courses in a practical form. I wanted a course which included vocational training, something geared towards the needs of industry. I spoke to my headmaster, who knew very little about computing but was able to recommend three polytechnics well-known for their work in that area," he says.

Study options

He applied to Teeside and Wolverhampton but North Staffordshire, at the time with the best polytechnic computing science course, accepted his application and he began to study there for his first degree in 1967.

The course had much in common with many others. Lectures on and high- and low-level languages, operating systems and IBM assembler formed much of the early work and Naylor went on to study options in simulation and data transmission.

During his third year he won a sponsorship from the National Coal Board and spent a year working in the systems development and evaluation section. "It is not uncommon for undergraduates studying computing degrees to find some form of sponsorship and I found the course I had been studying, with its heavy emphasis on practical programming skills, was very relevant to the work I had to do," he says.

He finished his vocational training and returned to the polytechnic, where he gained a first-class honours degree. He was then employed full-time by the Coal Board to design software to support a long-distance data transmission network.

At that time, many new applications for computers were being found and the industry was expanding rapidly. More and more people wanted to become familiar with the new technology and the educational establishments soon found that there was a shortage of people able to teach computing at a sufficiently high level to satisfy the demand. Many universities and polytechnics appealed to previous students and, as a result, Naylor returned to North Staffordshire as a lecturer.

Although he had no teaching experience, he proved to be a success and climbed the careers ladder steadily to more senior positions. While lecturing, Naylor studied for his MSc. That involved considerable investigation and some pure research into computer evaluation techniques and virtual memory systems.

After that, he joined a team of consultants developing a full Cobol compiler conforming to Level 2 ANSI 1974 in a collaborative project with GEC Computers Ltd. As he was still lecturing at the polytechnic, all the work had to be done in his spare time and it was almost five years before the compiler was completed.

"Writing a compiler program is something very few people have the chance to do and I am glad and proud that I had the opportunity. All companies keep their compiler programs secret, so our team had to work from the beginning – an even greater challenge," he says. In return, North Staffordshire was provided with £130,000 worth of computers by GEC.

After 12 years of lecturing at North Staffordshire, Naylor decided that it was time to move to gain more experience in other areas. He joined Thames Polytechnic as senior lecturer in September, 1984. Since then, in addition to all his teaching and administrative duties, he has become very active with the British Computer Society. He joined in 1975 and was appointed a Fellow in 1985. He is especially involved with the new Young Professionals' group.

Working party

"The society is very concerned about its younger members, as that is where its future lies. Many join as student members and, on graduation, find that they are too young to be eligible for full membership and simply drop out. The forming of the group is a major initiative by the BCS, dedicated to the 18-30-year-olds with its separate committee. It is hoped that many young computer professionals will take the opportunity to join," he says.

Naylor was chairman of the working party which defined and launched the Young Professionals' group and also chaired the three-day inaugural conference for the group, which included such speakers as Brian Oakley of Alvey and Ray Reardon of IBM. He is also a member of the BCS board of examiners and has been an examiner for part one of general paper one.

Since January, 1984, he has been a member of the working party organising and judging the BCS student programming competition and hopes shortly to join the council of the Society, where he will campaign further for the need of younger members.

Naylor is also involved with the revision of the BTEC guidelines for the submission of higher-level courses in computer studies and information technology.

He gives advice regularly to people wishing to follow a career in computers. "If you do not have a degree, you should study a full- or part-time course in computing. That will prove that you have a certain amount of ability and the necessary amount of commitment to move into the industry. Even for those with a degree in a non-computing subject, studying a short course is still the best way to demonstrate that you are committed to this type of work," he says.

Recently he finished writing a book, *Introduction to Programming*. It is aimed at first-year students on degree and HND courses in computing and is part of a new series to be published by Pitman. He prefers not to make long-term plans and instead reacts to opportunities as they arise. His overall advice to anyone wishing to move into computing is to keep their options open. "What is needed to succeed in computing is a logical mind, not stacks of academic qualifications," he says.

With more than 65 active members between 10 and 80 years old, Bournemouth Area Computer Club is large by any standard. Its meetings are held on the third Wednesday of each month at a local community centre which plays host to more than 70 clubs and associations. The club chairman, Bob George, says that the key aim is to promote knowledge of the ways in which computers may be used in applications other than playing games.

Most club members own Atari and Commodore machines but recently many members have begun buying computers in the Amstrad CPC range.

In the body of the club, two smaller user groups exist dedicated to those two machines. They meet on separate nights to exchange software or discuss problems which are common to their particular models of computer. At the moment those groups exist only for Commodore and Atari machines but because of the growing number of users, an Amstrad group is expected to start in the very near future.

The regular monthly meetings for all members are usually attended by around 30 people. Speakers from outside the club are invited to discuss the way in which computers are used in their industries or professions. One evening featured a member of Dorset police force, who presented a talk and slide show on the way computers are used by the police.

Radio hams

At another a member of Bournemouth Amateur Radio Society detailed the way in which it found computers useful. A representative of Enterprise Computers also visited the club and gave a demonstration of the latest model.

Many members are professional programmers, operators or hold jobs in the software industry. They, too, sometimes give talks and will give advice to the other members of the club when needed.

Although, as with most clubs, the members are predominently male, the Bournemouth club does its upmost to encourage female members to attend and the few who do are regular visitors. There are no restrictions to joining the club and the £6 annual subscription covers the hiring of the hall for the main club and the smaller user groups.

The members of Bournemouth Area Computer Club are never short of activities.

Seaside seminars

Young and old are encouraged to join and it is hoped that all will find something of interest. The oldest member, rumoured to be aged around 80, finds that using a computer helps to keep his fingers and mind active while the younger members enjoy writing programs or playing games.

George and other members of the club are not completely against games; they just think it vital that all computer users are fully aware of the potential their computers have for performing a wide range of other tasks and it is that philosophy which they hope to extend to other members of the community.

Visiting time

In the last few weeks a few members have travelled to many of the public libraries in the area to give demonstrations of computer programs ranging from *Counting with Cuthbert*, a educational game, to *Tasword*, the word processing package. That resulted from asking permission to advertise the club; the library supervisor enquired if it would be possible for programs to be demonstrated at the library so that people with limited knowledge of computers could become more aware of their capabilities.

The first session attracted a large attendance, which included staff from other libraries. One invitation led to another and now the club is busy on a regular basis, educating member of the public in the finer points of basic computing technology. The mini-exhibitions are held on Saturday mornings, considered to be the time when most parents are taking children to the library and both are encouraged to participate in the demonstration which it is hoped will generate sufficient enthusiasm to cause the parent to buy a computer and for both to join the club.

On a lighter note, the club stages competitions and fun evenings every so often. A recent computer treasure hunt involved solving a rhyming clue and collecting a set of 12 numbers. A short program then had to be entered to a computer and the numbers entered to produce more numbers. The final figures were matched with the correct answers at the next club meeting and the winner received a prize.

Other competitions have involved designing a Christmas card, using any graphics and drawing aids available, and well-known personalities from a local radio station were invited to do the judging. The latest competition plans involve designing a logo to be used for club advertising.

Now the club is busy planning a Home Computer Exhibition to be held on September 21. "Many people in the Bournemouth area rarely have the chance to see any of the shows or exhibitions linked to computing, as most are held either in London or Birmingham. We have decided to give local people the chance to learn more about computing," says George.

Local astronomy and amateur radio groups will also be at the show, demonstrating the way they use computers to help with their hobbies. George is also hoping that several software companies will attend to give sneak previews of their latest products.

Bournemouth must certainly be one of the most active clubs in the country. George says that his main aim is to "stimulate an interest in computing for all".

Anyone wishing to join should contact Bob George on 0202 510495.





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Thank you to Epson

You know how it is. First you cosset and nurture your new computer. Then after a time you forget what an uncomplaining little asset it is. You leave it switched on, grumble when it does not understand but, worst of all, you forget its intrinsic value and leave it exposed to the less-principled classes.

So it was with my Epson HX-20 which had served me well for two years. Rashly I did not bother to insure it, and, even worse, left it in the car where those self-same unprincipled classes could see it. They took it without asking me.

I was halfway through a piece of research work for a national magazine and most of the data was compiled on the HX-20, so the loss of my machine was disastrous to say the least. I was hard up and things looked grim. In desperation I wrote to the Epson Corp. telling of my plight.

Incredibly, 10 days later, Epson sent me a new HX-20. It was only on loan but, after all, it was my fault that I lost the original.

It is pleasant to know that at least one computer company still has the capacity for compassion. I would like to thank Epson and wonder if anyone knows of any other manufacturer which would do, or has done the same?

Jeremy Torr,
Telford.

Points for posting

In the July edition of *Your Computer*, J. Pieroux of Wiltshire complained about the difficulties he experienced in trying to return an item to another mail order firm. My company has maintained a very strong position in the mail order market for almost four years, by taking great pains to give customers cause to trust our service. For that reason, I hope that Pieroux and other readers will feel able to accept guidance from us.

First, if you have cause to return goods for a refund, sending them by recorded delivery is a waste of money. The Post Office pays compensation of up to £18 in respect of goods lost in the ordinary mail, whether the package was sent by RD or not. The most important point is to ask the Post Office for a Certificate of Posting, which is issued free.

If the goods are then lost, the certificate enables you to prove that you posted them and in those circumstances, under the Mail Order Code of Practice of the Advertising Standards Authority, the firm to which you returned them must not only pay compensation but also refund your postage.

If it does not, you can complain, without charge, to the ASA, which in turn can threaten to ban that firm's advertising unless it honours the payment. Of course, it would be reasonable to provide the firm with a photocopy of the Certificate of Posting, so that it, in turn, can chase the Post Office for its compensation.

If the goods are worth more than £18, you have two choices. You can either send them as a Compensation Fee parcel, which is cheap and takes only two working days, or as a Registered Letter, which is often quicker but more expensive.

The important point to remember is not to bother with Recorded Delivery which gives no additional benefits.

Harry Whitehouse,
Peaksoft,
Nottingham.

A cutting remark

I am writing to correct the impression given by your reviewer that the responses to input in the adventure game, *The Price of Magik*, are peculiar. If he had checked he would have found that a poniard is a dagger. Therefore, entering the phrase "Attack werewolf with dagger" when the weapon is not in your possession would generate the correct response: "You can't see the poniard".

Margaret Austin,
Level 9 Computing.

Apollo – not quite a PC clone

I was horrified to see a photograph of the Apollo DN3000 in the July edition of *Your Computer* captioned "We could not find a picture of the IBM/AT – instead we show one of the many clone machines."

Our DN3000 is about as near a clone of the PC/AT as a Porsche is of a Mini. Although the appearance of the two machines is similar, the technical specifications are very different. To name a few, the 3000 uses a 32-bit Motorola 68020 processor and MC68881 floating point co-processor, runs at 12MHz and has a palette of 4,096 colours with graphics-assistant hardware.

By comparison, the IBM PC/AT uses a 16-bit Intel 80286 processor, runs at 6MHz, and has a palette of 64 colours. Our machine is fully-compatible with all current applications including CAP, AI, factory automation and computer-aided software engineering. Finally, while the IBM PC/AT costs around £3,000, the Series 3000 computers have a starting price of slightly more than £9,000.

Jeanne-Marie Richards,
Apollo Computer (U.K.) Ltd.

MAN LOGIC

By NEIL BRADLEY







MICRO MARKET

DOUBLE HEIGHT

◆ *Commodore 64* ● *Paul Greensted*

A demonstration program which shows how, using the POKE command, characters of double height may be produced on the Commodore 64. When printed on the screen, the top half of a character is printed normally but the bottom half is reversed. To achieve the double-height effect, you have to print the lines twice in each mode. Demonstrations of the effects are given in varying colours. The poke command used would be a useful sub-routine when writing text or introduction for any program.



```
0 REM
1 REM    DOUBLE HEIGHT CHARACTER PROG
2 REM
3 REM        FOR THE COMMODORE 64
4 REM
5 REM          BY  PAUL GREENSTED
6 REM
 REM     MAIN LINES FROM 104 TO 113
8 REM
10 POKE5322,28:POKE53280,0:POKE53281,0
100 PRINT"[CLR][HOME][CYN]PLEASE[RIGHT]WAIT
":PRINT"[RVS][C]PLEASE[RIGHT]WAIT"
101 PRINT"[DOWN][C6]TEST 012345689.":PRIN
T"[RVS][GRN]TEST[RIGHT]012345689."
102 PRINT"[DOWN][C=3]DOUBLE[RIGHT]HEIGHT[RI
GHT]OF[RIGHT]EACH[RIGHT]CHARACTER[RIGHT]0-6
3"
103 PRINT"[RVS][RED]DOUBLE[RIGHT]HEIGHT[RIG
HT]OF[RIGHT]EACH[RIGHT]CHARACTER[RIGHT]0-63
"
104 POKE52,48:POKE56,48:CLR
105 POKE56334,PEEK(56334)AND254
106 POKE1,PEEK(1)AND251
```

PROGRAM LISTINGS

```
10 C12288:V3248
108 FORTØTO63:QT*8+V:KT*8+C
109 FORY1TO8:A(Y)PEEK(Q-1+Y):NEXT:B=1
110 FORPØTO:POKEK+P,A(B):BB+.:NEXT
111 FORPØTO:POKEK+P+1024,A(B):BB+.5:NEXT
:NEXT
112 POKE1,PEEK(1)OR4
113 POKE56334,PEEK(56334)OR1
114 PRINT"[DOWN][YEL]WRITTEN BY PAUL GREENS
TED 121985."
115 PRINT"[RVS][C1]WRITTEN[PIGHT]BY[RIGHT]
PAUL[RIGHT]GREENSTED[RIGHT]121985."
116 PRINT"[DOWN][WHT]PRESS ANY KEY"
11 PRINT"[RVS]PRESS[RIGHT]ANY[RIGHT]KEY"
118 POKE198,0:WAIT198,1
119 PRINT"[CLR]"
120 PRINT"[C]ABCDEFGHIJKLMNOPQRSTUVWXYZ"
121 PRINT"[BLU][RVS]ABCDEFGHIJKLMNOPQRSTUVW
XYZ"
122 PRINT"{DOWN][C3}012345689"
123 PRINT"[RVS][RED]012345689"
124 PRINT"{DOWN][B6]!#$%&'()+-\@*^:_<
[]"
125 PRINT"[RVS][GRN]!#$%&'()+-\@*^_<[
]"
126 PRINT"[DOWN][WHT]PRESS ANY KEY"
127 PRINT"[RVS]PRESS[RIGHT]ANY[RIGHT]KEY"
8,1
129 PRINT"[CLR][BLU]FOR THE NEP CHARACTER S
ET USE"
130 PRINT"[C][RVS]FOR[RIGHT]THE[RIGHT]NEW
[RIGHT]CHARACTER[RIGHT}SET[RIGHT]USE"
131 PRINT"[RED]POKE5322,28"
132 PRINT"[C3][RVS]POKE5322,28"
133 PRINT"[GRN]TOP HALF OF CHARACTERS ARE
    NORMAL."
134 PRINT"[C6][RVS]TOP[RIGHT]HALF[RIGHT]OF
[RIGHT]CHARACTERS[RIGHT]ARE[RIGHT]NORMAL."
135 PRINT"[BLU]BOTTOM HALF ARE IN REVERSE"
136 PRINT"[C=][RVS]BOTTOM[RIGHT]HALF[RIGHT
]ARE[RIGHT]IN[RIGHT]REVERSE"
13 PRINT"[RED]SO YOU PRINT LINES TWICE IN
EACH MODE."
138 PRINT"[C3][RVS]SO[RIGHT]YOU[RIGHT]PRIN
T[RIGHT]LINES[RIGHT]TWICE[RIGHT]IN[RIGHT]EA
CH[RIGHT]MODE."
139 PRINT"[GRN]BREAK THE PROGRAM AND LIST T
O SEE HOW I"
140 PRINT"[CYN][RVS]BREAK[RIGHT]THE[RIGHT]P
ROGRAM[RIGHT]AND[RIGHT]LIST[RIGHT]TO[RIGHT]
SEE[RIGHT]HOW[RIGHT]I"
141 PRINT"[BLU]HAVE USED THIS METHOD."
142 PRINT"[C=][RVS]HAVE{RIGHT}USED[RIGHT]T
HIS[RIGHT]METHOD."
143 GOTO143

READY.
```

TICK TOCK

```
  1 REM tick-tock
  2 GO TO 400
 10 RESTORE : CLEAR 39999:
    FOR n=0 TO 51: READ a:
    POKE 23300+n,a: NEXT n
 19 REM specify the wheel
 20 LET r=50: REM wheel radius
 30 LET p=PI/10: REM tooth
    pitch
 40 LET a=7: LET b=2: LET w=p/3
    : REM tooth depths & width
    angle
 99 REM 1st wheel position
100 PLOT 86,117 : DRAW -6,10:
    DRAW 90,-10,-2: DRAW -9,
    -9: REM lever is drawn
110 PLOT 82,123: DRAW 84,-6,
    -1.3
120 LET n=w: GO SUB 500:
    REM wheel is drawn
130 PLOT 100,150: DRAW 0,-7:
    PLOT 100,130: DRAW 0,-18:
    PLOT 100,27: DRAW 0,-27
140 PLOT 100,150: DRAW 54,0,-1:
    DRAW 0,-12: PLOT 154,124:
    DRAW 0,-12: PLOT 154,28:
    DRAW 0 ,-28: GO SUB 800:
    REM stand is drawn
150 RANDOMIZE USR 23300: CLS :
    REM drawing is saved
199 REM 2nd position
200 PLOT 89,113: DRAW -7,9:
    DRAW 90,0,-2: DRAW -7,-9
210 PLOT 84,119: DRAW 86,0,-1.3
220 LET n=-w: GO SUB 500
230 PLOT 100,150: DRAW 0,-12:
    PLOT 100,128: DRAW 0,-9:
    PLOT 100,28: DRAW 0,-28
240 PLOT 100,150: DRAW 54,0,-1:
    DRAW 0,-10: PLOT 154,128:
    DRAW 0,-16: PLOT 154,25:
    DRAW 0,-25: GO SUB 800
250 RANDOMIZE USR 23308: CLS
299 REM 3rd position
300 PLOT 93,108: DRAW -9,9:
    DRAW 90,10,-2: DRAW -6,-10
310 PLOT 88,115: DRAW 83,9,-1.3
320 LET n=0: GO SUB 500
330 PLOT 100,150: DRAW 0,-14:
    PLOT 100,123: DRAW 0,-10:
    PLOT 100,25: DRAW 0,-25
340 PLOT 100,150 DRAW 54,0,-1:
    DRAW 0,-7: PLOT 154,130:
    DRAW 0,-15: PLOT 154,27:
    DRAW 0,-27: GO SUB 800
350 RANDOMIZE USR 23316
399 REM recall the drawings
400 RANDOMIZE USR 23324
410 BEEP .005,-1: PAUSE 10
420 RANDOMIZE USR 23332
430 RANDOMIZE USR 23340
440 BEEP .005,0: PAUSE 12:
    GO TO 400
499 REM draw wheel sub-routine
500 CIRCLE 127,70,40
510 CIRCLE 127,70,10
520 CIRCLE 127,70,4
530 CIRCLE 127,140,2
540 FOR n=n TO 2*PI STEP p
550 LET c=COS n: LET s=SIN n
560 LET cp=COS (n+p):
    LET sp=SIN (n+p)
570 LET cw=COS (n+w):
    LET sw=SIN (n+w)
580 PLOT 127+r*c/2,70+r*s/2
590 PLOT 127+r*c,70+r*s
600 DRAW a*c,a*s
610 DRAW (r+b)*cw-(r+a)*c,
         (r+b)*sw-(r+a)*s
620 DRAW -b*cw,-b*sw
630 DRAW r*(cp-cw),r*(sp-sw)
640 NEXT n: RETURN
699 REM m/code
700 DATA 33,0,64,17,64,156,24,
    38
710 DATA 33,0,64,17,152,183,24,
    30
720 DATA 33,0,64,17,240,210,24,
    22
730 DATA 33,64,156,17,0,64,24,
    14
740 DATA 33,152,183,17,0,64,24,
    6
750 DATA 33,240,210,17,0,64
760 DATA 1,0,24,237,176,201
800 PRINT AT 21,0;
    "": RETURN
```

◆ *Spectrum* ● *G. Jackson*

Tick Tock produces a simple but realisting simulation of a rotating cog, complete with ticking sounds. After typing-in the listing, the program must be saved so as to auto-run line 10. The sequence begins with the computer drawing two separate wheel and lever positions. Switching between the two creates the illusion of rotation.

PLANETS

◆ *Amstrad* ● *A. Balmforth*

Planets is a short but interesting demonstration of colour-cycling on the Amstrad computer. Four spherical shapes rotate in different directions against a background of scrolling stars. As the game is written entirely in Basic, the initial calculation can take some time but, once completed, the result is entertaining.

```
10 INK 0,0:MODE 0:PEN 15:INK 15,24,8:ENT -
1,1,5,1:ENV 1,3,5,1,1,0,8,10,-1,10:ENV 2,3,
4,1,1,0,8,10,-1,10:GOSUB 6000
20 PRINT TAB(6) "ANIMATION"
30 DEFINT x,y,r,h,w,d,n:x=75:y=351:r=39:til
t=-PI/6:no=20:no2=3:GOSUB 1000
40  x=595:y=369:r=29:tilt=-5*PI/4:no=10:no2
=2:GOSUB 1000
50  x=310:y=200:r=156:tilt=7*PI/6:no=25:no2
=6:GOSUB 1000
60  x=100:y=-116:r=351:tilt=0:no=50:no2=14:
GOSUB 1000
70 GOSUB 5000:GOSUB 3000
80 INK 1,25:INK 2,10:ORIGIN 0,0
90 FOR i%=9 TO 14:INK i%,0:NEXT
100 SOUND 135,0:GOSUB 7010
110 WHILE INKEY$=""
120 FOR i%=3 TO 8
130 j%=i%-1:IF j%=2 THEN j%=8
140 INK j%,10:INK i%,25
150 INK j%+6,0:INK i%+6,15
160 FOR del=1 TO 100:NEXT
170 NEXT
180 WEND
190 SPEED WRITE 1:SAVE "!animat.scn",b,&C00
```

```
Ø,&3FFF
200 GOTO 11Ø
1ØØØ ' SPHERE SUBROUTINE
1Ø1Ø ORIGIN x,y
1Ø2Ø DEG:FOR phi=Ø TO 18Ø STEP 36Ø/(PI*(r*2
))*2
1Ø3Ø PLOT r*SIN(phi),r*COS(phi),2:DRAW r*SI
N(36Ø-phi),r*COS(36Ø-phi),2:NEXT
1Ø4Ø col%=3:RAD
1Ø5Ø FOR phi=Ø TO 3.1 STEP 3.1/no
1Ø6Ø '
1Ø7Ø h=r*COS(phi):w=r:d=Ø:alpha=PI/2+tilt:b
eta=PI/2:GOSUB 2ØØØ
1Ø8Ø col%=col%+1:IF col%=9 THEN col%=3
1Ø9Ø NEXT
11ØØ col%=1
111Ø FOR theta=Ø.5 TO 2.5 STEP 2.5/no2
112Ø h=-r/4*SIN(theta):w=r*SIN(theta):d=r*C
OS(theta):alpha=tilt:beta=1.5:GOSUB 2ØØØ
113Ø NEXT
114Ø RETURN
2ØØØ ' ARC SUBROUTINE
2Ø1Ø s=SIN(alpha):c=COS(alpha)
2Ø2Ø x=w*SIN(beta):y=d+h*COS(beta)
2Ø3Ø MOVE c*x+s*y,c*y-s*x
2Ø4Ø FOR gamma=-beta TO beta+Ø.1 STEP Ø.25
2Ø5Ø x=-w*SIN(gamma):y=d+h*COS(gamma)
2Ø6Ø DRAW c*x+s*y,c*y-s*x,col%
2Ø7Ø NEXT
2Ø8Ø RETURN
3ØØØ ' PATH SUBROUTINE
3Ø1Ø x=589:y=5Ø:r=4Ø:col%=9
3Ø2Ø FOR tilt=Ø TO 1.2 STEP Ø.Ø5
3Ø3Ø GOSUB 4ØØØ
3Ø4Ø x=Ø.9*x+39:y=Ø.5*y+17Ø.5:r=r*Ø.92
3Ø5Ø col%=col%+1:IF col%=15 THEN col%=9
3Ø6Ø NEXT
3Ø7Ø RETURN
4ØØØ ' SQUARE SUBROUTINE
4Ø1Ø ORIGIN x,y
4Ø2Ø s=SIN(tilt):c=COS(tilt)
4Ø3Ø MOVE r*(c+s),r*(c-s)
4Ø4Ø DRAW r*(c-s),r*(-c-s),col%:DRAW r*(-c-
s),r*(s-c),col%
4Ø5Ø DRAW r*(s-c),r*(c+s),col%:DRAW r*(c+s)
,r*(c-s),col%
4Ø6Ø RETURN
5ØØØ ' STARS SUBROUTINE
5Ø1Ø ORIGIN Ø,Ø
5Ø2Ø FOR i%=Ø TO 4Ø
5Ø3Ø x=639:y=9.5*i%:x1%=-2*(2+(INT(RND*2)+1
)):y1%=1-(INT(RND*3)):col%=(RND*6)+8
5Ø4Ø WHILE x>=Ø:col%=col%+1:IF col%=15 THEN
 col%=9
5Ø5Ø p%=TEST (x,y):IF p%=Ø THEN PLOT x,y,co
l%
5Ø6Ø x=x+x1%:y=y+y1%
5Ø7Ø WEND
5Ø8Ø NEXT
5Ø9Ø RETURN
6ØØØ ' music routine
6Ø1Ø READ tone,length:IF tone=9999 THEN RES
TORE:GOTO 6Ø1Ø
6Ø2Ø SOUND 1,tone,length,Ø,2:SOUND 2,tone/3
,length,Ø,1:SOUND 4,tone*2,length,Ø,2
6Ø3Ø ON SQ(1) GOSUB 6Ø1Ø
6Ø4Ø RETURN
6Ø5Ø DATA 319,48,338,16,379,48,338,16,319,3
2,284,32,253,32,319,32
6Ø6Ø DATA 239,32,253,32,284,32,319,32,338,3
2,379,32,338,32,426,32
6Ø7Ø DATA 319,48,338,16,379,48,338,16,319,3
2,284,32,253,32,19Ø,32
6Ø8Ø DATA 213,16,253,48,284,48,253,16,319,9
6,Ø,32,Ø,25Ø,9999,9999
7ØØØ ' sound routine
7Ø1Ø SOUND 7,RND*5Ø+5Ø,2ØØ,15,Ø,1
7Ø2Ø ON SQ(1) GOSUB 7Ø1Ø
7Ø3Ø RETURN
```

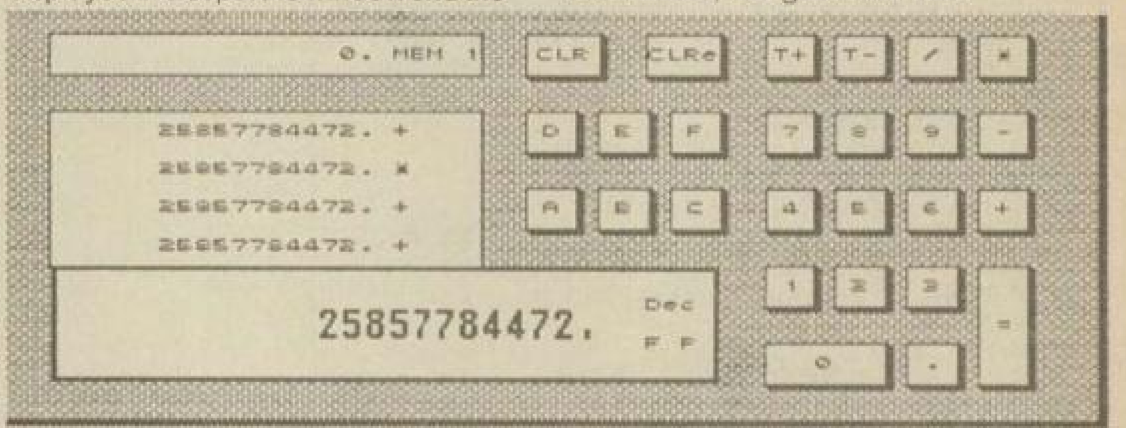
NUMBERS UP

◆ Amstrad ● R. Bhattacharya

Numbers Up is a fast-moving strategy game played against the clock. Twenty overturned counters are shown and, using the cursor keys or a joystick, you must find them in a set sequence. To turn over a counter, position the arrows around it and press fire or copy. If you choose the wrong counter, it is turned over automatically and you move to another.

If your choice is correct, the number is displayed in a separate window and the counter disappears from the playing area. It is important to try to remember the positions of any counters you find in the incorrect sequence so that, when they are needed, they can be found more quickly.

The position of the counters, however, is changed each time the game is played. During the game, a clock shows the elapsed time. If you fail to find all the counters in the correct sequence within one minute, the game will end.




```
100 DIM hu(20):cl=0:ro=1:co=1:pb=77:pc=150:
gn=1:ti=0:de=9
110 GOSUB 1080
120 MODE 0:PAPER 10:CLS
130 FOR x=1 TO 20:hu(x)=x:NEXT
140 FOR y=1 TO 5:FOR x=1 TO 4
150 g=INT(RND(1)*20)+1:IF hu(g)=0 THEN GOTO
 150
160 nu(y,x)=hu(g):hu(g)=0
170 NEXT:NEXT
180 CLS:PEN 2:FOR x=2 TO 12:LOCATE 4,x:PRIN
T "NUMBER'S  UP":NEXT
190 FOR x=15 TO 24:LOCATE 4,x:PRINT "NUMBER
'S  UP":NEXT
200 GOTO 240
240 GOSUB 630
260 CLS #1:PRINT #1,"            Find the num
ber 'gn;
270 LOCATE 13+co*4,2+ro*4:PEN 2:PRINT CHR$(
240):LOCATE 13+co*4,-2+ro*4:PRINT CHR$(241)
280 IF (INKEY(0)=0 OR JOY(0)=1) AND ro>1 TH
EN LOCATE 13+co*4,2+ro*4:PRINT " ":LOCATE 1
3+co*4,-2+ro*4:PRINT " ":ro=ro-1
290 IF (INKEY(2)=0 OR JOY(0)=2) AND ro<4 TH
EN LOCATE 13+co*4,2+ro*4:PRINT " ":LOCATE 1
3+co*4,-2+ro*4:PRINT " ":ro=ro+1
300 IF (INKEY(8)=0 OR JOY(0)=4) AND co>1 TH
EN LOCATE 13+co*4,2+ro*4:PRINT " ":LOCATE 1
3+co*4,-2+ro*4:PRINT " ":co=co-1
310 IF (INKEY(1)=0 OR JOY(0)=8) AND co<5 TH
EN LOCATE 13+co*4,2+ro*4:PRINT " ":LOCATE 1
3+co*4,-2+ro*4:PRINT " ":co=co+1
320 IF INKEY(9)=0 OR JOY(0)=16 THEN GOTO 36
0
330 ti=ti+1:IF ti=de THEN GOSUB 830:ti=0
340 GOTO 270
360 IF nu(co,ro)=0 THEN GOTO 340
370 PAPER 1:PEN 2:LOCATE 12+co*4,ro*4:PRINT
 RIGHT$(STR$(nu(co,ro)),2)
380 FOR t=1 TO 500:NEXT
390 IF nu(co,ro)=gn THEN GOSUB 420:PAPER 0:
gn=gn+1:IF gn=21 THEN 500 ELSE GOTO 260
400 LOCATE 12+co*4,ro*4:PRINT "  ":PAPER 0
410 GOTO 340
420 PRINT #2,GN;
430 FOR X=12 TO 1 STEP-1:SOUND 7,100*X,5,5:
NEXT
440 PAPER 0:LOCATE 12+co*4,-1+ro*<:PRINT "
  "
450 LOCATE 12+co*4,ro*4:PRINT "  "
460 LOCATE 12+co*4,1+ro*4:PRINT "  "
470 nu(co,ro)=0
480 RETURN
490 END
510 FOR X=1000 TO 1 STEP -5:SOUND 7,X,1,6:N
EXT
520 FOR x=2 TO 18:LOCATE 13,x:PRINT" Well D
one Clever Cloggs":NEXT x
530 PRINT #1,"  YOU'VE FOUND ALL THE NUMBER
S !!!!!"
540 FOR t=1 TO 5000:NEXT
550 RUN
570 FOR X=1 TO 1000 STEP 5:SOUND 7,X,1,6:NE
XT
580 FOR x=2 TO 18:LOCATE 14,x:PRINT" Out of
 time.Hard luck!":NEXT x
590 PRINT #1,"     NEVER MIND..TRY AGAIN ."
600 FOR t=1 TO 4000:NEXT
610 RUN
630 MODE 1:PAPER 0:CLS:INK 0,6:INK 1,12:INK
 2,20:INK 3,15:PEN 2
640 FOR x=90 TO 270
650 DEG
660 PLOT 120+100*COS(x),290+100*SIN(x),3
670 NEXT x
680 DRAWR 100,0:DRAWR 0,-90:DRAWR 360,0:DRA
WR 0,290:DRAWR -460,0
690 FOR x=1 TO 360
700 PLOT 120+90*COS(x),290+90*SIN(x)
710 NEXT x
720 PLOT 226,105:DRAWR 348,0:DRAWR 0,280:DR
AWR -348,0:DRAWR 0,-280
730 PEN 1
740 FOR x=1 TO 4
750 LOCATE 16,-1+x*4:FOR y=1 TO 5:PRINT CHR
$(248)CHR$(247)CHR$(249)CHR$(32);:NEXT
760 LOCATE 16,x*4:FOR y=1 TO 5:PRINT CHR$(2
47)CHR$(247)CHR$(247)CHR$(32);:NEXT
770 LOCATE 16,1+x*4:FOR y=1 TO 5:PRINT CHR$
(250)CHR$(247)CHR$(251)CHR$(32);:NEXT
780 NEXT
790 LOCATE 8,3:PRINT "0":LOCATE 12,7:PRINT
"15":LOCATE 7,12:PRINT "30":LOCATE 3,7:PRIN
T "45"
800 WINDOW #1,2,39,24,24:PAPER #1,1:PEN #1,
2:CLS #1
810 WINDOW #2,2,39,21,22:PAPER #2,3:PEN #2,
0:CLS #2
820 RETURN
840 PLOT 120,295,2
850 DRAWR SIN(cl)*60,COS(cl)*60,0
860 cl=cl+6
870 PLOT 120,295,2
880 DRAWR SIN(cl)*60,COS(cl)*60,2
890 PEN 2:PRINT CHR$(22)CHR$(1);:LOCATE 8,7
:PRINT CHR$(231)CHR$(22)CHR$(0)
900 SOUND 1,730-cl*2,5,5
910 IF cl=360 THEN GOTO 560
920 RETURN
1070 RETURN
1090 SYMBOL AFTER 247
1100 SYMBOL 247,255,255,255,255,255,255,255
,255
1110 SYMBOL 248,3,15,31,63,127,127,255,255
1120 SYMBOL 249,192,240,248,252,254,254,255
,255
1130 SYMBOL 250,255,255,127,127,63,31,15,3
1140 SYMBOL 251,255,255,254,254,252,248,240
,192
1150 RETURN
```

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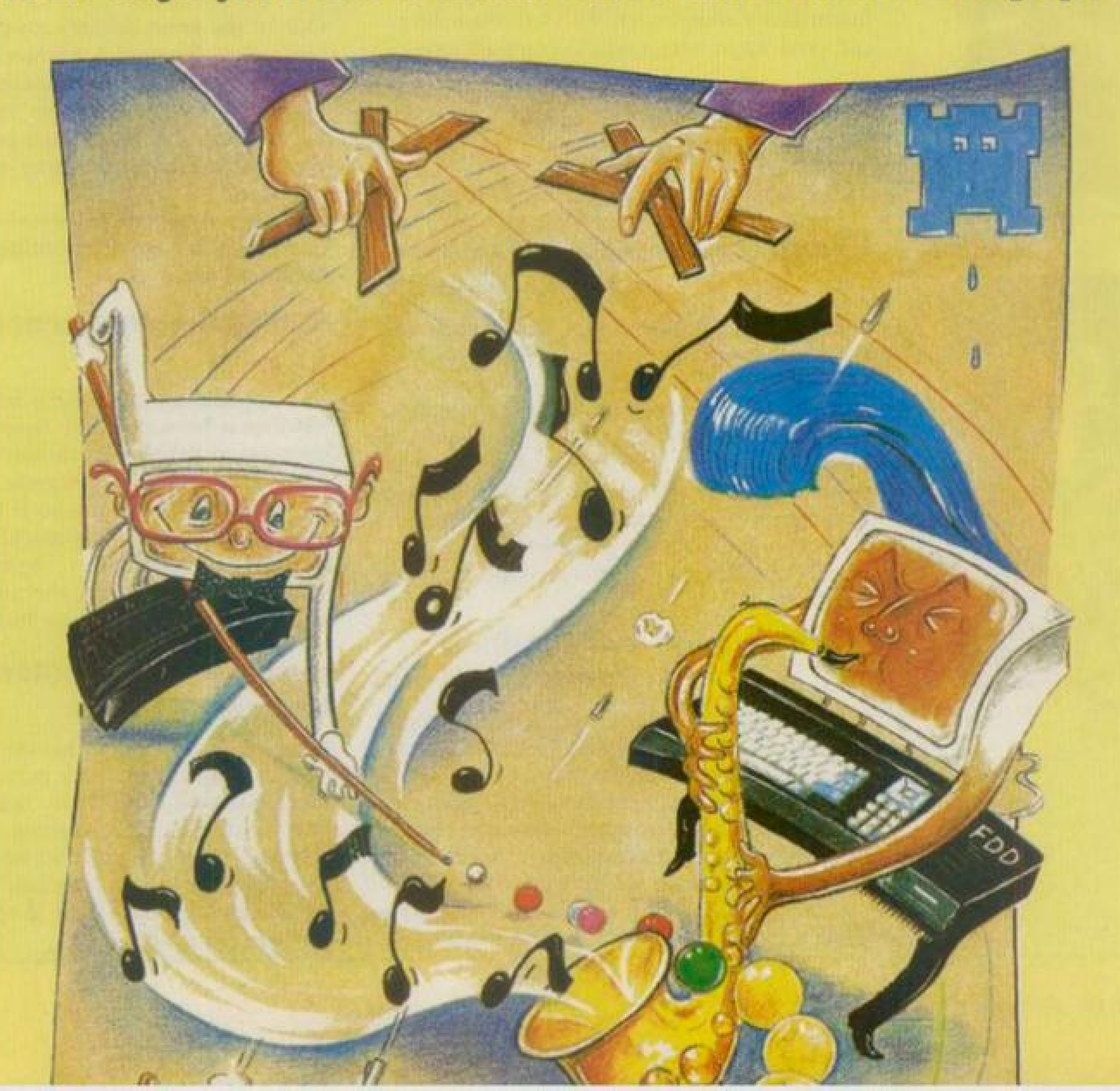
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Your COMPUTER COURSE

INDEX

The *Your Computer Course* is finished now but by no means forgotten. In six months we taught you about the basics of programming, languages, operating systems and the specifics of colour, music and games development on a number of popular machines. The only thing we have not taught you is how to use the course. That is what we now propose to do.



There are five major areas covered by the course in all its constituent parts:

Languages. Coverage of most of the major languages used on popular microcomputers, along with some of the popular implementations of those languages.

Glossary. A complete A to Z glossary of computing terms, written with style, panache and a good deal of humour by our resident wordsmith John Lettice.

Machine code. A start-to-finish beginners' guide to machine code on all the popular processors, including the Motorola 68000, the 6502 and the Z-80.

Sight and Sound. A tour round the music and graphics capabilities of most makes of home micros, with a guide to how they can be incorporated into entertainment software.

System Software. A look at operating systems and how they can be used to get control of the internal hardware of a machine to the greatest effect.

March, 1986



Tools of the programmers' trade — Pages 2 and 3

Computer languages are really tools to help you do the job of operating your computer. In this article the Basic language, the most popular language among users of home computers, was introduced. Basic, though, is only one of a range of languages available to the microcomputer programmer. Prolog, Comal, Forth and Pascal are all available for the popular home computers and the pros and cons of each are discussed.

Musical pictures — Page 8

Probably the most exciting programming task you can undertake with your micro is getting it to generate impressive music and pictures. *Musical pictures* describes a number of techniques for developing graphics software for use in programs and includes listings of three programs, one for the Spectrum and two for the Commodore 64.

Talk the language of your micro — Pages 6 and 7

Computers are stupid; when you start to use machine code you will appreciate just how stupid they are. Mastering machine code programming will permit you to achieve graphics and music effects beyond the scope of interpreted languages such as Basic. *Talk the language of your micro* introduces the concepts of machine code programming with particular reference to the 8-bit Z-80 processor.

April, 1986



Orchestral manoeuvres — Page 14

The Midi – Musical Instrument Digital Interface – is a standard convention for the connection of musical instruments to microcomputers. It is a serial interface which allows up to 16 instruments to be controlled by a single computer. The power of a computer when harnessed to the modern electronic instruments allows even the tyro musician to compose impressive musical compositions.

UMI-2BB interface — Page 16

This is a short review of a Midi interface designed for use with the BBC micro. The review emphasises the ease with which a Midi interface coupled with appropriate software permits even the novice to compose impressive musical sounds.

To structure or not? – that is the question — Page 16

One of the great debates among programmers centres on the need for structured programming, which divides the large number of jobs in any program into small, manageable portions. In this article, the pros and cons of the structured programming question are discussed.

May, 1986



Computer-generated graphics — Pages 18 and 19

Computer graphics is one of the main growth areas of the home computer industry. Of all the applications which can be set for a micro, few are as immediately rewarding as the generation of on-screen pictures or graphics. Input devices such as lightpens, mice and graphics tablets have meant that anyone can produce graphics; no longer is programming excellence required. Even so, programming graphics directly requires a wide range of information; this shows you how.

Machine code sub-routines — Pages 22 and 23

Programs of any size are usually made of smaller sections. When using Basic, they consist of PROCedures or GOSUBs, which allow individual sections to be controlled. Writing machine code is much more laborious than Basic, so even programs of only 1K require splitting into several sub-routines, the equivalent of PROCedures. Having written a series of sub-routines you will find that you build a library and the routines can be used again and again.

Amstrad sound generator — Page 23

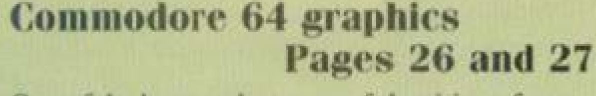
Any application can benefit from sound, whether it be subtle help beeps for a business program to massive earth-shattering bangs, zaps and crashes for a new game. Sound usually arrives last in programs, so if there is only a little memory remaining, machine code may be the only realistic answer. On the Amstrad, sound is achieved using the programmable sound generator. We show how.

Pascal – two popular implementations — Page 24

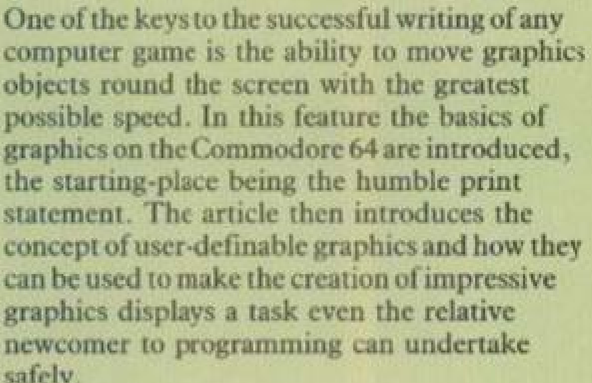
Most programmers go through a quest for the perfect language for their particular purposes. Having moved from Basic, most will sample Forth and perhaps even Prolog. On the whole, however, there will probably be a prolonged, if not permanent, halt at Pascal, a high-level language which has much to offer the experienced programmer.

The constituent parts of the course form the basis for a solid grounding both in your ability to program and your access to the features specific to your machine and its processor. It is our hope that the course, in total, is thus a good deal more than the sum of its parts.

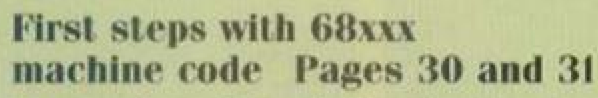
June, 1986



Commodore 64 graphics Pages 26 and 27



One of the keys to the successful writing of any computer game is the ability to move graphics objects round the screen with the greatest possible speed. In this feature the basics of graphics on the Commodore 64 are introduced, the starting-place being the humble print statement. The article then introduces the concept of user-definable graphics and how they can be used to make the creation of impressive graphics displays a task even the relative newcomer to programming can undertake safely.



First steps with 68xxx machine code Pages 30 and 31

Many are deterred from the idea of learning to use machine code because it takes a great deal of effort to do even the simplest things. The 68xxx series of microprocessors, as used in the QL and Atari ST, has an elegant instruction set which makes programming in machine code an easier task than on many 8-bit micros. *First steps with 68xxx machine code* introduces the basics of machine code programming with this series of MPUs and presents some useful information for the programmer.

Operating systems – a key role Page 32

Behind every good micro is an operating system which can usually take most of the credit for the functioning of the system. CP/M is the best-known of the 8-bit operating systems, being one of the first available for microcomputers when they became available in the late 1970s. This article explains the function of an operating system, with particular relevance to CP/M and to the way in which it operates with both the hardware of a system and the applications software used with a system.

July, 1986



Computer-animated design Pages 34 and 35

Programming good games programs depends mainly on the quality and smoothness of your animation. Using PRINT and CLS commands may achieve movement but it is jerky and slow. It is far better to use x and y co-ordinates to measure the movement accurately. To complete the rock-collecting game, these animation techniques will prove essential and will add to the overall quality of the game.

Beginners' guide to the 6502 Pages 38 and 39

In the last five years, the 6502 processor has proved to be one of the most successful and powerful processors available, with machines such as the BBC and 64 relying on it. One of the main reasons is that it is much easier to program than the Z-80. However easy programming the 6502 is, you will still need an assembler to make the most of the power of the processor. An assembler translates easily-understandable mnemonics into the numeric codes which the computer requires to create a source file.

Forced into submission Page 40

The CP/M submit utility allows users to prevent keying repetitive sequences of commands at the keyboard. Computers such as the Amstrad CPC and PCW range have a wide variety of CP/M commands no-one will ever use. SUBMIT really can be used practically.

August, 1986



Making the most of your computer Page 42

Given any programming problem to solve, programmers will have at their disposal a number of tools which will help them arrive at a solution to the set task. The best programmers are those who make effective use of the many programming aids available to them. *Making the most of your computer* outlines the way to more efficient programming.

Finding the language for your needs Page 44

Fortran is not a language associated normally with microcomputers, yet versions of it are available for machines as diverse as the BBC, the QL and Atari ST. The main reason for the large number of home micro editions of Fortran is that it remains a popular teaching language in schools and colleges. This article introduces the Fortran language, highlighting its features.

Mastermind on the BBC Page 45

Mastermind, the popular seventies strategy game, is used to illustrate a number of games programming techniques which can be incorporated into readers' programs. As a bonus, a full listing of the game for the BBC micro is given. While the program is written for the BBC computer, it is possible to convert it to run on other micros.

Multi-tasking Pages 46 and 47

If you look at the commercial games available you will notice that the action normally involves more than one object moving on the screen at any time. Not only that, but a tune may be playing in the background. The concept of doing more than one thing at any time is known as multi-tasking. The concepts of programming in a multi-tasking environment are introduced in this article, which includes a number of practical programming examples for popular computers.

Making use of the world's oldest medium Page 48

The final page of the final part of the course lists a number of books which will develop the skills developed during the six instalments of the *Your Computer Course*.

To guide you round the completed course, we suggest several ways of using it, depending on how much you already know about computers and how they work. If you consider yourself a complete novice, we suggest you read the course in the following order:

Musical pictures, Sight and Sound, p.7, March, 1986; Orchestral manouvres, Sight and Sound, pp.14-15, April, 1986. To structure or not, Programming, p.16, April, 1986. Computer-generated graphics, Graphics, pp.19-20, May, 1986. Commodore 64 graphics, Graphics, pp.26-27, June, 1986. Computer-animated design, Graphics, pp.34-35, July, 1986; Operating systems, Systems Software, p.32, June, 1986. Forced submission, System software, p.40, July, 1986. Making the most of your computer, p.42, August, 1986. Mastermind, Programming, p.45, August, 1986. World's oldest medium, Books, p.48, August, 1986.

If you already have a reasonably good grounding in Basic programming and have a primary understanding of how computers work, you can probably pass over those beginners' elements of the course and begin your reading from the next stage, which we suggest should be read in the following order:

Tools of the programmers' trade, Languages, p.3, March, 1986. The Forth language in action, Languages, pp.10-11, April, 1986. Pascal, Languages, p.24, May, 1986. Finding the language for your needs, Languages, p.44, August, 1986. Talk the language, Machine code, pp.6 and 7, March, 1986. Machine code sub-routines, Machine code, pp.22-23, May, 1986. First steps with 68xxx M/C, Machine code, pp.30-31, June, 1986. Beginners' guide to 6502, Machine code, pp.38-39, July, 1986. Multi-tasking, Machine code, pp.46-47, August, 1986.

The final area we covered in the course was John Lettice's A-Z Glossary of computing terms. It should be read and kept as a reference guide. It may be read in any particular order, since it is written in a friendly and entertaining fashion.

The big question, of course, is whether or not you passed the course. Only you can tell us that.

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QUESTIONS

1. ***Name two well-known Gremlin platform games?***
2. ***Which famous arcade game conversion is Gremlin undertaking for U.S. Gold?***
3. ***Gremlin is working on a sequel to* Jack The Nipper. *In fewer than 10 words, what would you call the game?***

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Split screens on Commodore Trailblazer.



Gremlin Graphics

Francis Jago looks at this successful company which has great plans for the future.

Sheffield, for some reason, seems to be a hot-bed of high-quality computer games. As well as some highly-talented individuals, the city has spawned one of the most consistently innovative of all software houses, Gremlin Graphics.

Started two years ago, Gremlin could scarcely have asked for a better start than Tony Crowther gave it with *Monty Mole*, which was both its first release and its first major hit. As time passed, managing director Ian Stewart decided that Gremlin had great potential and set up a full-time development team.

Originally it consisted of one programmer but, reflecting Gremlin's commitment, that has now enlarged considerably to 17, most of whom work and live in Sheffield. Recently Gremlin has really begun to expand and, with its range of products expanding rapidly, Stewart's ambition of achieving five percent market share seems a distinct possibility.

Although still primarily a games company, Gremlin recently has launched a range of utilities under a new label, Discovery. It will include products such as The Code Machine, a beginners' assembler/disassembler, and Animator, a excellent new animation package launched recently for the Amstrad. Also new on the Discovery label will be EMU, a promising electronic music package.

Popular products

One of the main reasons for the position of Gremlin at the top is the number of machines it supports. Not only will it try to release games on the 64, Amstrad and Spectrum but, if at all possible, it will convert them for the C16 and MSX.

Supporting the C16 has paid dividends and has firmly established the company as one of the top two C16 software houses. When one considers that more than 50,000 C16s were sold in the Christmas period of 1985 it is not a market to be sneezed at.

It is one of the most recent releases, *Way of the Tiger*, which is the biggest-ever seller, with sales approaching 100,000 units across all formats.

In the next six months, Gremlin intends to establish itself firmly as a producer of continuously excellent games. Its most recent, *Jack the Nipper*, is almost certain to start a new trend, with its cartoonesque graphics and animation. As with many of its previous releases, it is the amusing scenario, not just the excellence of the programming, which produces such popular products.

Too difficult

However successful Gremlin has proved in the last two years, what must have be a surprise to it was the failure of *Bounder*. Stewart attributes that to one thing:

"It was too difficult. We know it was a good game but unfortunately it failed to capture public imagination," he says.

One thing certain is that it will not happen again. As well



Future Knight for the Commodore 64.

as owning Gremlin, Stewart owns the only microcomputer shop in Sheffield and all his games are tested thoroughly by hundreds of eager schoolchildren before they reach the shelves.

Respected throughout the industry, Gremlin programmers recently won the contract to program *Gauntlet* for U.S. Gold. Although they have been working on this coin-op conversion for only two months, it promises to be one of the biggest licensed games ever and is due for release just before Christmas, which for Gremlin promises to be the most successful yet. As well as the continuing sales of Jack the Nipper, which will have been converted to the Commodore 64 by then, there are four spectacular new releases, all of which could reach number one, one of which must do so.

The first is *Footballer of the Year*. Released to coincide with the beginning of the new season, it promises to start where *Football Manager* left off. In the Gremlin game you take control of an individual footballer and the object is to be as successful as possible. Transfers, league championships, goal bonuses and many more features should make the game a strategist's delight.

For arcade fans, Gremlin has something for everyone. *Pentacle*, for the Commodore 64 and Atari, is a arcade/adventure which achieves everything for which Ultimate strived so unsuccessfully. Graphically superb, the game involves travelling round a maze, collecting four valuable candles and finally disposing of the evil demon.

Described by the programming team as a "the first ever blast-venture", Future Knight will be available at first only for the 64, with other versions following soon after. In keeping with Gremlin tradition, the player takes control of an incredibly cute character, this time called Randolph, and it is his task to rescue his beloved maiden from the clutches of Spegott the Terrible.

Using some of the best backgrounds yet seen on the Commodore, with a total of 20 levels, Future Knight will keep Gremlin at the forefront of platform game technology.

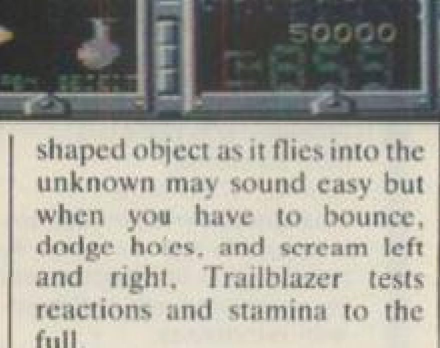
If one of the new releases shines more than any other it must be *Trailblazer*. Available initially for the 64, Spectrum and MSX, with an Amstrad version following soon after, it takes many of the excellent features of *Bounder*, combines them with true arcade addictiveness, and results in a game destined to be a classic.

Controlling a football-shaped object as it flies into the unknown may sound easy but when you have to bounce, dodge holes, and scream left and right, Trailblazer tests reactions and stamina to the full.

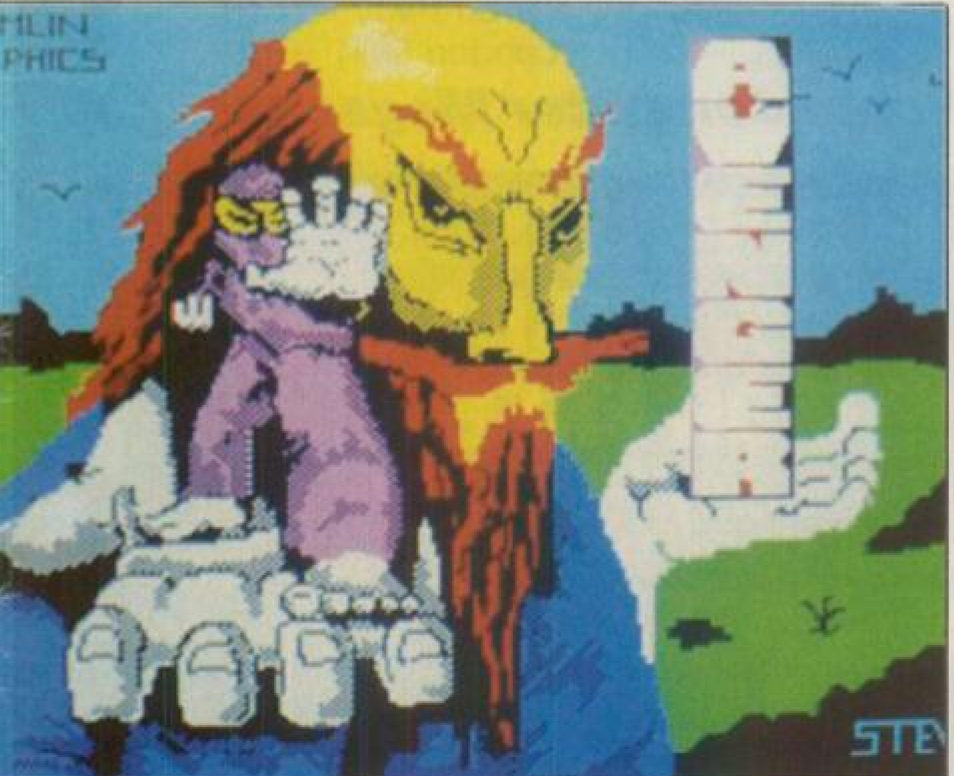
One title a little further away, nearer 1987, is the follow-up to Way of the Tiger. Called *Avenger*, it takes a more adventurous path than its predecessor and should appeal to a wide variety of players.

Stewart, with his partner Kevin Norburn, has created a company of which to be very proud. In a market where companies seem to care too little for the individual, Gremlin games stand out, both in terms of quality and popularity. If the customer is always right, Gremlin is one of the top software houses in the U.K. and its success is deserved.

Finally, watch for *Monty Mole III*, coming soon to your micro.



Stage 2 of Future Knight.


Way of the Tiger II – Avenger.



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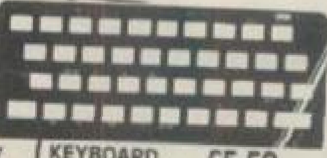
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NEXT MONTH

Highlights of the October issue

BUYERS' GUIDE TO LOW-COST PCs

The Amstrad PC may have been launched by the time our September issue is on sale. On the other hand it may not have been. Notwithstanding the availability of the Amstrad PC basher, an increasing number of PC clones are available for little more than the price of other computers associated traditionally with use in the home. Next month we review a selection of such computers and examine their likely impact on the low-cost computer market in the coming months.

SPECTRUM/AMSTRAD COMPUTER REVIEWED

The fruits of much feverish activity in the last few months are due to be unveiled in early September when Amstrad launches its re-engineered version of the Sinclair Spectrum. We review the new machine and assess its impact on the starter pack computer market.

WIN £1,000 PLUS A SELECTION OF INSTANT PRIZES IN OUR AUTUMN GOLD COMPETITION

The front cover of next month's *Your Computer* will feature a special card which could win you £1,000. The special rub-off cards are the key to an exciting competition which, in the succeeding months, offers readers the chance to find the *Your Computer* Crock of Gold.

In addition, instant prizes are available if you have one of the winning cards.

FLIGHTS OF FANCY

We review some of the classic flight simulators of the past and investigate how some more recent offerings compare.

Contents subject to late revision

October issue on sale September 26, 1986

NEWS ● REVIEWS ● HINTS & TIPS
CLUBS ● SOFTWARE GUIDES

DIARY

THE 8TH OFFICIAL COMMODORE COMPUTER SHOW

A Commodore Computer Show, specially for the north of England, will be staged from September 12-14 at the University of Manchester Institute of Science and Technology. More than 15,000 visitors are expected for the show, which will have 75 stands with displays and demonstrations of all the latest hardware, software and peripherals for the Commodore range of home and business computers.

THE 9TH PERSONAL COMPUTER WORLD SHOW

The major event in any computer enthusiast's calendar, the 9th PCW Show will be held at Olympia 1 and 2 from September 3-7. There you will be able to see the latest state-of-the-art hardware and software products for a wide range of home and business machines. Hundreds of new games and products are due to be launched, including the long-awaited Sinclair-Amstrad computer.

AMSTRAD COMPUTER SHOW

Another Amstrad computer show will be held at the Novotel, Hammersmith from October 3-5. All the stands are fully-booked and a record number of exhibitors is expected. A major attraction will be the Amstrad theatre which will host continuous presentations of the latest developments and technology, much of it with a business theme.

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